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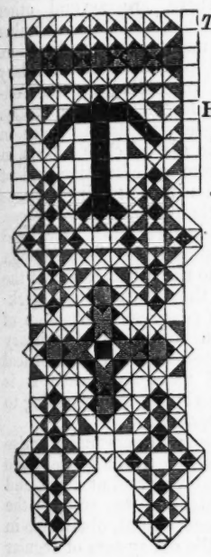


Technical Education at Home and Abroad.

THE Royal Commission appointed in 1881 to inquire into the subject of the instruction of the industrial classes of certain foreign countries in technical and other subjects for the purpose of comparison with that of the corresponding classes in this country, and into the influence of such instruction on manufacturing and other industries at home and abroad, have presented a second and very important instalment of their labours. A preliminary report, issued several months ago by the Commissioners, among other matters gave an account of the primary instruction of France, but in the present report, Part I., the general scheme of education on the Continent is dealt with, being an introductory account of primary and secondary schools in France, Switzerland, Zurich (town and canton), Germany, Austria, Belgium, Holland, and Italy. In this first portion the special trade and technical schools abroad are described under five divisions, comprising every school available for artisans, artisans' general technical schools, and apprenticeship schools, intermediate technical schools for foremen and technical departmental managers, women's trade and professional schools; and, fifthly, higher technical instruction for employers, managers, &c. The first part concludes with an account of art-schools, galleries, and museums. Part II. comprises visits to industrial establishments, with some details of the work essayed and accomplished in them. Part III. deals with various educational institutions, science and art schools, colleges, museums, and workshops visited in the United Kingdom. In Part IV. we have the Commissioners' conclusions, with comparison in respect to home and foreign methods, the state of matters as regards Ireland, agricultural education, and the final "Recommendations" of the Commissioners. Of a report or reports dealing with such a wide and varied range of subjects, it would be impossible in any one or two articles to do more than present the reader with a few of the chief bearings of the inquiry with regard to technical education of the workman and its influence on the future of our British industries. In France at present instruction in the use of tools is becoming general in the primary schools, and this system may have good results, as in some countries the working classes receive the only educational training on which they have to depend for life in the primary schools. In the secondary schools in France the instruction is still mostly on the old classical lines, save in some of the Lycées; additional time is given to mathematics in the last two years by boys intended to enter the higher technical schools. In regard to the higher elementary schools a relatively smaller number of youths are prepared for those of the higher type, but some of them appear to be secondary schools. The physical sciences, chemistry, &c., form subjects of instruction here, and a considerable time is given to them, and these institutions are furnished with excellent laboratories. The Commissioners admit, speaking generally, that the ordinary schools of France excel ours as a preparation for the technical school. In the primary schools greater attention is given both to geometrical and free-hand drawing, the latter being entirely from models, and there is also instruction in the use of tools. Again, the advantage in regard to the secondary schools is in the giving of more time to mathematics, especially in the upper classes of the Lycées. A knowledge of drawing is necessary to workmen in nearly all crafts, but it is indispensable to building workmen, and we have never ceased in this journal to keep the fact before the country. The school system of Switzerland must be judged by that which obtains in Zurich (town and canton). As in other parts of the country the elementary and secondary education is gratuitous, and the first-named compulsory. The system embraces primary, secondary, evening, and high schools. All children between six and fourteen years of age must attend school, and have to remain in the primary school until the age of twelve. Swiss children, however, usually attend the Kindergarten schools from the age of four to five, conducted according to the system of Froebel, but the attendance is optional here, and these schools have no State endowment. Children on leaving the primary school at the age of twelve, can either attend the secondary school or they may, subject to the prescribed attendance at a supplementary school, begin practical life. The course in secondary schools extends over four years, and those entering such schools, and remaining in them for two years, or until fourteen years old, are free from further school attendance. As a contrast with the cost of School Board buildings in London, we may mention that the Zurich elementary school building amounted to 43,000*l.*, or 66*l.* per head. Irregularity of attendance is unknown; all children learn one foreign language; all are taught drawing, and have object lessons in natural history. In the higher classes there is rudimentary instruction in chemistry, and museums form a noteworthy feature in the Zurich schools. The higher schools in the canton comprise the gymnasium or classical school for preparing for the University or the Polytechnic and the Trade School (Industrieschule) which prepares for the Polytechnic or for direct entrance into trade. The Trade School, which is entered at the age of fourteen, comprises four classes, extending over three years and a half, The first being a preparatory one. There are two divisions or wards from the secondary schools, a technical section and a commercial one, the former again dividing in the third and fourth years into a mathematical and natural science section. The commercial section ends with the third year. In the cantonal school, consisting of a gymnasium and a trade school under the same roof, the teaching of the highest class is in advance of that found in smaller schools in the country. In connexion with the physical collections is a small workshop containing a water motor for working the dynamo and used for the repair of apparatus, &c., but only by the teacher and his assistants. Drawing forms an important feature of the instruction of this school, an average of six hours per week being devoted to this subject. The influence of such schools on the industries of Switzerland must be great. There are middle-class private schools in England, and their name is legion where drawing, or rather copying, occupies attention merely for one hour on one particular day in the week. In Germany, as in Switzerland, education is compulsory. With the exception of those children who are preparing for the higher secondary schools, all classes of the population are educated in "Volksschulen" or public elementary schools. The children enter at six and remain until the age of fourteen. Most of those intending to pursue their education in the secondary schools enter a preparatory school in place of an elementary, generally leaving that school at the age of nine or ten. In most parts, the secondary schools consist of higher elementary and secondary schools proper. There are three kinds of secondary schools in North Germany, the Gymnasium or Classical

School, the Real Gymnasium, in which Latin is taught, but not Greek, additional time being given to science and mathematics, and the Ober Real School, where a still greater amount of attention is devoted to drawing and science, the modern languages being substituted here to the entire displacement of Latin and Greek. The complete course of instruction in any of these schools occupies ten years. Pupils who have obtained the leaving certificate from the Gymnasium are entitled to enter any of the faculties of the University or the Polytechnic schools. There are sundry other schools in Germany under various designations. Modern languages, mathematics, and science, though forming the main subjects of instruction in the higher Real Schools of North Germany, yet it appears that but few of these schools are fitted with laboratories. Secondary as well as elementary schools are under State supervision, and the system of instruction in the schools of the same grade is practically the same. The communes or municipalities entirely support the primary schools within their district, save in the case of the very poorest communes, which receive some aid from the State or province. In many districts or large cities primary education is entirely gratuitous, and in nearly all primary schools the fees are extremely low. So the children of necessitous parents in all cases are enabled to receive free education. With scarcely an exception, the schools are day schools, and throughout Germany secondary private adventure schools are practically unknown. This is quite unlike the system that obtains in the United Kingdom, where private adventure schools are very numerous, although yearly a great reduction in their number is taking place. The Commissioners, in remarking upon the extent of secondary education in Germany, avow that secondary instruction of a superior kind is placed within the reach of children of parents of limited means, "to an extent of which we can form no conception in this country." In Austria the elementary schools are of two grades, lower elementary schools with three classes chiefly in villages, and higher elementary schools with four grades. The higher schools have six or seven classes. Although lower elementary instruction is compulsory, compulsion does not exist with respect to attendance at the higher elementary schools. The middle schools, like those of Germany, comprise Real schools, Real gymnasia, and gymnasia proper; and the high schools include universities and polytechnic schools. There are also infant, orphan, and convent schools, special schools for the blind, deaf and dumb, and seminaries for teachers. Though the infant schools are supported partly by the commune, and partly by private societies and by manufacturers, and proprietors of industrial establishments, they are under State supervision, but they receive no Government grants. Every higher elementary school has in connexion a continuation school at which attendance is compulsory for those children not attending a school of a higher grade, from the time they leave the primary till they reach the age of fifteen. Poor children have their school fees remitted. The fees vary from 1s. 8d. to 6s. 8d. for those who can pay. The continuation schools are partly maintained by the State. Children who wish to carry their education further leave the primary school at twelve, entering the fourth class of higher elementary school, from which they may pass to the gymnasium. The Real school is one of the special schools of a professional character. The secondary schools of Austria are similar to those of Germany. Some of these intermediate schools visited by the Commission in Vienna are carried on in magnificent and well-appointed buildings, having excellent teaching apparatus, and well-equipped laboratories. The gymnasiums are either public or private institutions, the Real school being often partly supported by the State and the commune. In Belgium school attendance is not yet compulsory, but there must be at least one public (Government) school in each commune. Gratuitous instruction can be demanded by parents, and some communes make their schools free to all. There are a number of clerical schools in Belgium. The Government schools are inspected by Government officials, who have no right to enter the clerical or private schools. It is open to all to establish schools of every kind, the principle of freedom of instruction is carried so far. It is stated that 30 per cent. of the total adult population of Belgium at the age of conscription can neither read nor write. The statement that 60 per cent. of the children of school age (six to fourteen) in Belgium are in the Government schools, 25 per cent. in clerical and private schools, and 15 per cent. not attending school at all, are statistics not admitted by the clergy, who state that they have 40 per cent. of the children in their schools. Belgium has no factory laws, hence children may be employed at any age, but public opinion has greatly restricted the employment of children to the age of twelve, and proprietors of factories often establish half-time schools. The cost of public primary education is defrayed in about the following proportions :—By the commune, 33 per cent.; province, 17 per cent.; the State, 50 per cent. As regards secondary education in Belgium, the Government intermediate schools are of two classes,—the higher elementary or middle-class, where the fee is 2*l.* 8s. per annum. The secondary schools or Athénées have a fee of 4*l.* per annum. The town usually provides the building,—the State making up the difference between the fees and the cost of teaching. Many scholarships exist from the primary to the middle-class schools, and preparatory schools are attached to the latter. The education of middle-class children is usually completed in the higher middle school, which is entered at nine and left at fourteen to sixteen years of age. Now, in Great Britain and Ireland, formerly parents and masters were interested to see the youth apprenticed to a trade at fourteen, so that his seven years servitude would end when he reached his majority at twenty-one years of age. The preparation for the Athénée in Belgium is usually in private schools or by home teaching. The institution is divided into two branches, literary and scientific and professional, and in each of these there are seven classes, but no Latin is taught on the professional side. The Government Athénées, or day schools have boarding-houses attached to them in large towns. There are numbers of primary and secondary schools under the clergy in which the education is parallel with that of the Government schools. They are more numerous than the latter, and in these clerical Athénées it is stated that a much higher salary is paid to professors than in the State institutions, some of the best teachers in Belgium being found in these clerical schools. No Polytechnic schools exist in the country; the higher technical education being carried on in the four universities. In Holland the communes are responsible for providing adequate school accommodation for primary instruction. The elementary schools are divided into ordinary and superior; there is no compulsory attendance, and one half of the children attending school pay no fees. In 1880 the total cost of primary instruction in Holland was 800,000*l.* for about four millions of a population. Of this sum only 100,000*l.* come from fees. The school attendance for the year reached 540,000, of whom 400,000 were in public schools. The number of primary teachers was about 14,000. Holland had in the same year 150 secondary schools containing about 15,000 pupils. The greater number of these schools are superior intermediate schools similar to the German Real Schools. They are non-classical, and prepare for trade, university faculties of medicine and philosophy, as also for the only Dutch Polytechnic school at Delft, and for higher technical academies. The other secondary schools include twenty-four gymnasia, and five progymnasia of a similar kind to those in Germany. In 1883 the total cost of education in Holland was estimated at 1,250,000*l.*, of which 375,000*l.* was provided by the Central Government. We finish our notice of the primary and secondary schools on the Continent by some brief details in relation to Italy, where primary education is both free and compulsory, though the law of compulsion in respect to some parts of that country appears to be a dead letter. Children on leaving the elementary school may either enter the gymnasium (only found in cities), if they are preparing for a classical education, or into the technical school if they are intended for a commercial or industrial career. There are five classes in the gymnasium; the students of the fifth class may graduate as licentiates, passing into the lyceum, which is a higher school, only found in a few of the chief cities; there are three classes in the lyceum, the highest of which leads to the university. The technical schools corresponding on the industrial side to the gymnasium on the classical side have three classes of one year each. The chief objects of these schools is to prepare for trade, but they are also attended by those who are to continue their studies at the technical institutes, or at the professional schools. In addition there are three higher class technical institutes, corresponding nearly with the Polytechnic Schools of Germany. Besides the State Free Schools in Italy, there are several other schools, the Kindergarten, and a large number of private schools under clerical direction. Such, then, is the primary and secondary system of education prevailing on the Continent, of which the foregoing is a summary. We deemed it necessary to devote space in illustration of first and second class schools in the Continental system of education, and of the kind of instruction imparted in these, as a preliminary of technical education proper. Primary instruction is becoming more and more moulded and shaped in these foreign schools, with a view to the actual wants of the age, keeping in sight the future of the workman. A good deal of practical information of course can be given to pupils in primary schools, including free-hand and geometrical drawing, the use of tools, &c., when it is understood that those youths are intending to follow industrial occupations.

In a second article we will pass under notice a few of the most noticeable of the special trade and technical schools abroad and at home, and particularly those intended to supply the training, at least to some extent, obtainable in the workshop under the old system of regular apprenticeship, which, it is to be regretted, is fastly disappearing. For the present we will only remark that it is a satisfaction to us to know that in our many articles on technical education, and the wants of our workmen, particularly those of the building and kindred trades, we anticipated long since much of what is at present realised at home and abroad, including even some of the "Recommendations" with which the Commissioners conclude their second report. Finally, in our next paper, we may make some observations on the scope of technical education, pointing out some difficulties that stand in the way of its efficient application, owing to the changed condition of manufacture, resulting from the spread of machinery and the minute sub-division and organisation of labour that now obtains in many of our national industries.

THE LONDON OF THOUSANDS, AND THE LONDON OF MILLIONS OF INHABITANTS.

THE admirable reproduction of a street of Old London,—noticed in a recent number,—which, by a curious irony of arrangement, immediately adjoins the display of machinery for electric lighting, in the Exhibition now struggling into order at South Kensington, has unusual interest at a moment when such grave questions affecting the future welfare of the metropolis are in the air. It is not our object at the present moment either to raise the artistic question, to describe the details of the treat which,—and it must have been at a very considerable cost,—has been provided for the visitors to the Health Exhibition, or to discuss the theory or the detail of administrative reform. Our aim is rather to avoid all points of controversy,—to shock no school of taste,—but to point out certain features of material

importance which, for good or for evil, must dominate the structural development of the London of the future.

"Unfeigned regret," says a writer whose pen it is not difficult to recognise, "will be experienced that the London of to-day is not like the London of Dick Whittington, of Izaak Walton, of the Duc de Sully, and all the other personages whose habitations are grouped together in such an enchanting manner. In fact, the lesson which every thinking Londoner will carry away in his mind from a visit to South Kensington in the present year of grace will be that the capital city is fifty degrees uglier now-a-days than it was in an epoch which we are generally taught to regard as almost barbarous."

A scale of ugliness has yet to be contrived; and hard and long would be the contest before it was admitted as a canon of art in any branch. Nevertheless, it is impossible to observe the change which has come over the building aspect of the country within the last few years, without admitting that the writer whose words we have cited has expressed opinions that are very generally held. We wish, however, rather to look at the transformation undergone by London in the past, and to see how far we may expect the continuance or the variation of the process in the future of change, than to express any appreciation of its artistic value. It must be remembered that we see the beautiful work of Mr. George Birch fresh with all the lustre of novelty. To the interest attaching to reproduction is added that which is due to good and unspoiled workmanship. The mimic antiquity,—valueless as it may be if regarded from the stand-point of a pedantic antiquarianism,—has in the eyes of nine visitors out of ten no small advantage over the real antiquity, could such be found. And found it can be. It would add to the value of the description given in the "Official Guide to the International Health Exhibition," if dates, as near the mark as possible, were attached to the different houses. Elizabeth's reign is given as the date of No. 14, and the date 1480 is attributed to the Fountain Inn in the Minories. Now, in not a few parts of England, notably in the streets and in the vicinity of Guildford, are to be found houses of equal age. One, a country grange, part of the stonework of which is attributed to the reign of John, bears the date 1485 (if we remember aright) on many of its massive timbers. A fine gabled mansion at Merrow, which sank to the office of a roadside inn in the days of coaching, and is now only a yet more humble public-house, bears openly its date of 1615. We could point to instances in the same neighbourhood where the style of the structure, the character of the wood-carving, and the condition of the houses challenge a very early age. If these are comparatively rare, it is due to the fact that timber is not imperishable. On a sudden a whole front of great age and great beauty may give warning that if it is not taken down,—for reconstruction, let us hope,—it will take itself down; and the main point is, that in any but buildings of which the importance is so great as to mask the spoiling touch of time by the very grandeur of their decay, squalor creeps on with age. Thus our counterfeit but fresh old London has one kind of charm which would have been absent in the real antique; whatever claim that may have on us in its relics, or may have had on the coeval inhabitants of the City.

In the change which has occurred since the Elizabethan and the Stuart times there is much more that has to be regarded than the change of fashion. That the pure incalculable caprice of what we call fashion is one element of architectural change there can be little doubt. In dress this caprice is now, perhaps, the most potent of all causes of change. But even in dress the progress of science and of art has had no small influence. The whole growth and development of defensive armour, from the time of William the Conqueror to that of Henry VIII., has been regulated rather by reason than by fashion. With improvements in offensive weapons, defensive clothing became more and more complete, cumbrous, and complex, until the time when gunpowder gave to the bullet a force which no armour could resist, and plate and scale armour, as well as mail, disappeared almost at once. But during the greater part of four centuries the fashion of dress was, to a considerable degree, determined by the exigencies of the armourer.

That in architecture, as in dress, there have been structural or material reasons for changes of style is universally admitted. Pure caprice may, no doubt, have had its influence,—an influence which is not, perhaps, indistinguishable in the building of the present day. But apart from these two causes, and, we apprehend, far more effective than either, is that mighty solvent before which old laws, old habits, old customs, old tastes, everything that is old, at least, in Western Europe, has yielded, namely, increase of population. In 1560 London did not reach beyond Charing Cross to the west; Holborn ran along its northern fringe; its eastern boundary was about half a mile from the Mansion House, and narrow strips of building lined the river as far as Westminster and Wapping. The borough had an extreme width of a third of a mile, and an extreme length of a mile and a quarter. Roughly measured, the area could not have been much more than double that of the city proper, or from 1,200 to 1,400 acres. If we allow the same density of population over this area as that which now exists in the "Central London" of the Registrar General, the London of 1560 held some 105,000 to 125,000 inhabitants. The "Greater London" of the census of 1881 covered 697 square miles, and held, in that year, 4,764,312 inhabitants. In the City alone the population had fallen from 74,688 in 1871, to 50,276 in 1881, figures which, comparing area with area, accord very closely with our above estimate for 1560.

So mighty a change as the multiplication of a body of citizens by forty fold must have had an influence on habit and on abode of an irresistible force. It must have told, silently and imperceptibly, on every element of structural design. Look at such a question as that of the proper width of streets and area of public places. All the inhabitants of so vast a province do not, of course, seek daily the same centres of occupation. Possibly there are few persons now to be found who have ever passed through London, from east to west, or from north to south, in a single day, except it were by railway. But what would be the difference required in the width of such a line of street as that running along the Strand, Ludgate-hill, and Cheapside, when it was the main thoroughfare for a city of one, two, or three hundred thousand inhabitants, and when it becomes one of the parallel routes for the traffic of a city of four millions and more?

This question of the capacity of thoroughfares for traffic is one that is intimately connected with such structural changes as distinguish the Old London Street at South Kensington from, let us say, the Westbourne-grove of to-day. Each house reproduced in the former had its individuality. The house was the architectural unit of the city. It is so no longer. It is the street that is the unit. In Old London each trader not only sought to give importance, character, attractiveness, to his house or shop, but provided,—as is to be well seen in the restoration,—for the comfort of the pedestrians. Under the jutting verandahs or shed roofs that protected the open shop-fronts, shelter from a passing shower was at any time attainable. And no doubt, for this cause, a rainy day may have been very good for trade.

At present it is not the question whether we admire the old shelters, as architectural features, or not. Their re-introduction, with all their picturesque convenience, would be simply impracticable; and that for the sufficient reason that a check would thus be imposed on the circulation through the streets, which would make them absolutely impassable. Neither fashion, nor taste, nor the improved command of building materials which enables us to give such convenient shelter to our railway platforms, can outweigh this question of capacity for traffic. If all London were to agree to shelter its footways the case might be different. But a partial shelter, thus effected, would cause such an absolute block, in heavy showers, as to be totally out of the question.

This is but one example of the influence which the increase in magnitude of a city must have on its architecture. Many more might, no doubt, be found. Not to weary our readers with the research, let us recall one effect of the Fire of 1666. At that date, as far as we can ascertain, the domestic architecture of London was for the most part essentially wooden in its motive as well as in its material. Overhanging stories gave picturesque lines of shadow. They may have gradually become more and more architecturally characteristic from the time when the war-ships of the sea kings were drawn up on the beach, and converted into homes for the sturdy settlers. At all events, the employment of massive timbers was an essential element of stability in this mode of building. With the terrible lesson of the Great Fire, it is more than probable the use of wood in urban building became more questionable; the cost of whole beams of oak also became comparatively higher. Thus brick came to supersede framed houses; and one of the pictorial elements of ancient London, swept away by the fire, has never been, in the main, reproduced. Nor should it be omitted to note that in the recent return to the ancient pictorial style,—without the structural safeguard of massive timbers,—we have in not a few cases seen menace of future danger. A heavy front resting only on projecting joists, however numerous, would come down in hopeless ruin if dry rot attacked the thin and narrow timbers.

Another element of degradation in the architectural character of a great city arises from the ever-increasing demand for cheap abodes. We can, to a certain extent, measure this demand, and in so doing we obtain a remarkable proof of its force, although we are far from asserting its limit. Over the "Inner London" of the Registrar-General (as may be gathered from the twelfth report of the Local Government Board, if the information thence abstracted be compared with the details given in the census), between six and seven houses stand on each average acre of ground, and the rateable value per house is 56·6*l*. That is the general outcome of the metropolis, and the average accommodation given is equal to 7·4 souls per house, giving a mean density of population of 50·6 souls per acre.

But if we take the City of London proper, the heart and nucleus of this province, what do we find? Every acre contains ten houses, and houses of such palatial size as to be rated at an average of 540*l*. per annum each. Notwithstanding this, the census population is only at the rate of between seven and eight persons per house, or seventy-eight persons per acre; (of course, the day population is much more). Contrast this with Shoreditch. There, between twenty-three and twenty-four houses stand on each acre of ground; or, deducting one-fifth of the area for roadways, a house on every 166 square yards of land. Each house is rated at 31·5*l*. per annum; yet in each of these small houses are packed more inhabitants than in those which, over the average of "Inner London," have nearly twice the rateable value. There are 8·3 persons to every house in Shoreditch, or 195 per acre. It would be hard to show more pithily what extremes of wealth and of poverty have to be accommodated, as best he can effect, by the architect in London.

Taken per inhabitant, the range of rateable value of house-room is from 68·8*l*. in the City of London to 4·6*l*. in Shoreditch. In Woolwich Union the rateable value is as low as 3·5*l*. per head accommodated. But here there are less than two houses per acre, so that the density of 6·8 persons per house bears no comparison, from a sanitary point of view, with that of the 8·3 per house in Shoreditch. There, as we before showed, the terrible density of 195 persons per acre is the average over a square mile of ground. In the Woolwich Union as yet this creeping malady of density has only attained the measure of little more than 12 persons per acre. The proportion between the indicated deficiency of accommodation, and increased payment for rent, in the

more populous union is as striking as it is melancholy.

It is, however, matter for very attentive regard how completely the great province, now growing and developing at the rate of 2½ per cent., or thereabouts, per annum, has organised a provision for its main needs. The five millions and upwards of inhabitants of the "Greater London" of the Registrar-General will require, at the modest allowance of 2 lb. per head, at least 4,500 tons of food per day. Of ale, wine, spirits, tea, coffee, or whatever may be the beverage in each case, we cannot reckon the demand at less than 800,000 gallons per day. In point of fact, to quench that potent thirst, to afford the water for cooking, washing, baking, for the use of manufactures, for the extinction of fires (at least five of which may be daily expected), for the watering of roads and of gardens, and, more exigent than all, for the daily subterranean removal of from 6,000 to 7,000 tons of the effete products of vital combustion, more than 140 million gallons of water are daily supplied, collected from sources at twenty, thirty, forty miles distant from the points of supply. Thirty gallons per head of the population per day are thus distributed at a far lower cost than would be involved by the simple process of dipping buckets in the nearest stream or well in the London of 1560. The lowest cost at which, it was estimated in 1850, a house of the value of 10*l.* per annum could be supplied with water by ordinary household service, was two-pence three-farthings per week, or, within a penny, twelve shillings a year. To a house of that rental in London upwards of 200 gallons per day is supplied, available by the turning of a tap, at the cost of eight shillings per year. In Paris, at the present time, great part of the population is supplied by water-carriers at the price of five centimes per pail, or about six gallons for a penny. The supply which is afforded to the humblest resident in London, taking the average per day, if paid for at that rate, would cost 7*l.* 12s. per annum! Three-fifths of the Paris charge goes to pay the labour of the water-carrier, who has to pay 2 centimes per pail for the water that he draws from a stand-pipe. The lowest possible subscription for direct water supply from the Company in Paris is 2*l.* 8s. per annum, or six times the minimum in London.

The rateable value of London, in 1855, is given by Sir J. W. Bazalgette at 10½ millions sterling. Its increase since that date, taking Inner London alone, has been at the rate of 625,000*l.* per annum, the corresponding increase of population being at the rate of 70,000 per annum. But in all remarks of the kind we must guard against the idea that "London" is anything but a topographical expression, except to those who have some conception of the character of the distinct provinces which make up the imperial whole. For that whole comprises a fifth of the population of England. Its inhabitants exceed the aggregate of those of Paris, Berlin, Vienna, Rome, Dresden, and Turin. The English spoken in its eastern differs from that of some of its western districts as widely as does the English of the time of Queen Victoria from that of the time of Queen Elizabeth. There is a wider difference between the rental of the citizen of the chartered mother city, and that of the dweller in populous outskirts, than there is between Pekin and Berlin. Five great railway companies compete to carry coals to the metropolis at,—it has been stated before Parliament,—a heavy loss to the proprietors. Six hundred thousand cubic yards of scrapings are annually removed from the streets. A snow storm, it is true, gets the better of London. But so it does, if heavy, of our country roads and even of our railways. Perhaps a hot-water system may be hereafter organised for the removal of snow and slush. Some 400,000 pedestrians, together with 75,000 vehicles, pass daily over the Bridges of London. About an equal number arrive and depart by the three metropolitan railways alone. Considered as a whole, the daily life of this great province, and its comparatively easy working, present a spectacle which in its way is almost unparalleled in the world.

RUSSIAN ARCHÆOLOGICAL PROGRESS.

ARCHÆOLOGICAL news comes always somewhat slowly from St. Petersburg, and this year the issue of the annual "Compte-Rendu" is unusually late. When it does appear, however, the imperial magnificence of its illustrations atones for the long delay. From the preliminary "Rapport" we learn that not only have the excavations at Kertsch been steadily continued, but comparatively new ground has been broken on the peninsula of Tamana and in the immediate neighbourhood of Anapa on the eastern shore of the Black Sea. We say comparatively, because in 1876 the three artificial mounds known as the "Three Sisters" had been previously opened and in part investigated by M. Bayern, working for the Caucasian Society. More thorough excavations have now been undertaken by the Russian Government, and were conducted by Baron Tiesenhausen. They have yielded abundant and important, though not sensational, discoveries, and they are to be continued by M. Verebusoff, the director of the Kertsch Museum.

At least three-fourths of the tombs opened had been already rifled, though not altogether despoiled. This is the bitter disappointment that constantly awaits the excavator. Two tombs, however, not far from the "Three Sisters" mounds were discovered intact. From them were obtained vases, chiefly adorned in relief, a bronze cup and mirror, leather sandals, and a coin of Panticapæum. On the wrists of a woman's skeleton were still remaining bracelets of wooden beads. On her fingers four rings are engraved with a figure of Apollo holding in the left hand a bird, in the right his bow. On the neck of the same skeleton was a gold chain ornamented with lion-heads, and a necklet of beads, mixed gold, wood, and stone; earrings were also found with designs representing Eros, and on the skull there lay a circular gold plaque with a head of Hermes in *repoussé* work. This tomb may serve as a sample of similar "finds," full particulars of which are given in the Rapport.

The Rapport is followed, according to custom, by a Supplement, which is, perhaps, the most important part of the whole issue. It consists of the publication, in magnificent plates, of the principal objects found in the Kertsch and other excavations, or that have been otherwise acquired for the Hermitage Museum, with a commentary by the Director, L. Stephani. The commentary we may dismiss. It has its own peculiar reputation among archæologists, which reputation the present number maintains, but the plates should appeal to more than a specialist public, and, unhappily, from their great cost, they become little known.

Plate I. gives a very remarkable series of silver bowls, gilt by a process of which, so far as is known at present, these are unique instances. The engraved designs are precisely in the style of the early red-figured Attic cylix-painters; in fact, from the plates the most expert eye would take them to be fine specimens of the fifth century B.C. ceramography, not silver engraving. As it is, three out of the four have the air of translations from vase technique into metal-work. One represents a charming Victory (Nike) seated, and with a phiale in her hand; the second, Bellerophon and the Chimæra; the third, Mænads and Satyrs; the fourth, of later and altogether different style, apparently represents a scene from family life. With them are published a delicate stag's head in gold, a small bronze Anaduomene, and two exquisite gold earrings. The silver cups were found in the "Seven Brothers" tombs, but their exquisite designs only appeared later after careful cleaning.

Abundant though bronze Etruscan mirrors are, a mirror with pure Greek engraving is still a rarity. The second plate of the "Compte Rendu" gives us not indeed a mirror but a mirror case engraved with a design of extraordinary beauty. The drawing shows perfect mastery of the human figure, and yet the treatment of the drapery is fringed with archaism about the folds, which leads us to place the work late in the fifth century B.C. It represents a youth leaning on a club and standing in front of a seated woman figure. This mirror case was found in the neighbourhood of Kertsch. With it appeared two lovely gold necklaces of unusual patterns, and forming an odd contrast in style; a silver cup, Persian work of the time of the Cassanides. The cup is remarkable as an instance of a Greek thought uttered, so to speak, in Persian phraseology. The Greek love-god Eros appears in the centre of the cup, seated cross-legged on a quaint hoisted Persian lion and playing a thoroughly Persian and wholly un-Hellenic guitar. The cup was found near Irbib.

In the apartment of terra-cottas we have a very well preserved lekane, the design in which is interesting as representing a toilette scene in the gunaikonitis of a Greek house. The drawing is rough and sketchy. Also a terra-cotta fragment, valuable because it represents a scene of worship in the presence of a very archaic xoanon, several terra-cotta masks finely worked, a figure of Eros winged and standing in the conventional Praxitelean pose, a muse playing the lyre, and others of less importance. With these terra-cottas we may note a very fine female statue restored as a torch-bearer, and a head of Aphrodite.

The gems which occupy the fifth plate merit a separate notice, not only for their intrinsic beauty, but for the manner of their reproduction. Each important gem is copied twice; once from the original to give the effects of colour, once from a cast, which throws up minute detail to much better advantage. Conspicuous among the rest are two sardonyx cameos, — a magnificent head of Zeus and a Medusa head executed in exactly similar style. The types of both are post-Pheidian. A second sardonyx cameo is inferior in workmanship, but represents an interesting and not very usual subject,—the acquittal of Orestes. Athene is dropping her vote into the urn, and the sacred character of the place is marked by the archaic figure of the Palladium. We need only enumerate other cameos,—a Dionysus, a Perseus and Andromeda, an Orpheus, a Ganymede. A small chalcedony claims attention from its unusual type. Zeus, seated, holds on his outstretched right hand three diminutive female figures. We are left to choose between the Hours, the Graces, and the Fates. This habit of holding subordinate deities on the hand is familiar enough to literary tradition, but extant artistic evidence is rare. The very early artists, Tektaios and Angelion, when they made an image of Apollo for the temple at Delos, placed on his left hand the figures of the three Graces,—one playing the lyre, another the flute, and another the syrinx. The attributes of the figures in our gem cannot be made out. We have only space further to enumerate a glass paste of Apollo in the "Apollino" attitude, with his Delphic accompaniments of tripod, raven, griffin, serpent; a sard with the Emperor Pertinax and his family; a Byzantine sardonyx (Valerian I. or II.); and two Persian cylinders.

NOTES.

THERE is some talk among the non-successful competitors in the first competition for the new War Offices, of the advisability of endeavouring to arrange among themselves for an exhibition of all the designs which were sent in, including the eight which must still be unsuccessful (presumably the selected design will not be available for exhibition), so that everyone who has given labour and thought to the subject may at least have such a return for it in public appreciation as might be afforded by an exhibition of their work. In our opinion it would have been more desirable, and certainly more generous to the architects, if the Government had itself initiated a public exhibition, and allowed the competitors at least the credit of their work; but riding rough-shod over architects is such a favourite amusement with private individuals at the present day, that perhaps it is hardly to be expected that a Government Department should not take its turn at the sport. As it is, the matter seems to rest now entirely in the hands of the competitors themselves. We have had some in-

formal communication on the subject from one of them, representing the views of several others, and we have been asked to make public the fact that certain of the original competitors wish for such an exhibition, and would be glad to know the views of others. We shall be happy to assist the arrangement by publishing the names of those who are desirous to co-operate in it.

THE subject of the competition came up in the House of Commons on the evening of the 5th ult., in Committee on Supply, when a question was asked as to the advisability of including a residence for the First Lord of the Admiralty in the new buildings. Mr. Shaw-Lefevre said it was an open question whether a residence in the main building or contiguous to it was a necessity either in the case of the First Lord, or the First Naval Lord, or the Commander-in-Chief, or the Secretary for War. The same arguments applied to all four cases. But the residences for the First Lord and the Naval Lord could be provided immediately contiguous to the main building if found necessary. In reply to a question from Mr. Rylands as to whether some architects had not sent in more than one design, and what was the real number of competitors, the answer (as reported in the *Times*) was that "the number of contributors was 128, and each had sent several contributions towards one design." The wording of this would convey the impression that all the competitors had sent in several designs. The meaning must have been that each one had sent in several drawings of one design, viz., plans, sections, and elevations, as usual in such cases; but the expression "several contributions to one design" would certainly convey a different impression to most readers.

IT is understood that the authorities of the National Gallery have recommended the purchase of eight pictures out of the Marlborough Collection. These are the "Madonna Ansidei" of Raffaele, an exceptionally fine example of the painter's earlier style; three paintings by Rubens, the "Venus and Adonis," the "Graces," and "Andromeda," and the "Distribution of the Rosary," by the same painter, a small study. The remaining three on the list are a portrait of the Duke of Hamilton by Mytens, a female head by Sebastian del Piombo, and a Spanish seaport, attributed to Weenix. These three latter are presumably selected as filling up historical gaps in the national collection. The disposition to add materially to the present collection of works by Rubens will no doubt be criticised by some who do not sympathise with his exceedingly robust style of subject and execution; but as we are half way to an exceptionally good representation of him at the National Gallery, it is certainly a point of wisdom to supplement it in order to make a special feature in our Gallery. It is worth while to be the chief representatives of Rubens in European galleries, for the sake of the man as well as of his works.

AT the same time, we fear that the feeling that there is honour and credit, and even indirect material gain, to ourselves as a nation, in the possession of great works of art, is getting more and more weakened. Sir W. H. Gregory addressed an eloquent and certainly not uncalled for protest to the *Times* of Thursday last in regard to the melancholy fact that our great private collections are coming one after another to the hammer, and no one cares. It is, as he truly says, "a widespread public concern. Besides the shame of the richest nation in Europe allowing its noblest works to fall into foreign hands, to do so would be almost tantamount to the final suppression of so many public collections. Show-galleries like the Blenheim and Leigh Court collections, liberally exhibited to all comers as they have ever been, were heretofore almost as much the property of the nation as of the actual owners, so far as access is concerned. In Italy the Government actually claims the right of pre-emption of works of art sold within her territory, and exercises that right constantly and without reluctance." But we are fallen on days when what may be called the spiritual value of an acquisition is of no account; when material value only is reckoned. Over and over again of late years has the English Government been solicited to purchase for the National Gallery or the British Museum treasures which it should be the pride of any cultured nation to possess, only to reply with a cold *non possumus*. "Peace, retrenchment, and reform," if you like, but no Art; for we have become a practical people and cannot see the value of it. Do those who reason thus ever think that works of art are the expression of the joy of life; that indifference to their production or possession is an indication of the decay of the spiritual or intellectual life of a people, of their capability of joy? Apparently not. It is of no consequence: buildings may be ugly as long as they are economical and well drained; things of beauty which it was the glory of former Englishmen to have collected, may go and be the pride and glory of other nations, rather than that we should put our hands into our well-filled pockets. To our thinking, the spectacle is more than pitiful, it is ominous; and as we see one collection of archæological and artistic treasures after another allowed to slip out of our hands, works of great minds whose equals may not be found again, we think of the legend in Josephus of the voices that were heard in the Temple, before the fall of Jerusalem, saying "Let us depart hence."

THE last number of the "Mittheilungen des Deutschen Archæologischen Institutes in Athen" contains a paper by R. Koldewey which should be of great interest to students of ancient architecture. A full account is given of the great Græco-Roman bath of Alexandria-Troas (the modern Eski Stambul). The ruins are sketched in the "Ionian Antiquities" of the Dilettanti Society, but by this society as well as by Texier, in his "Description de l'Asie Mineure," the ruins were described as belonging to an ancient gymnasium, and this erroneous supposition led to erroneous descriptions and restorations. These have been now corrected, and a detailed and accurate report is given, accompanied by lists of measurements, sections, and a full architectural plan. The method of conducting and distributing the water in the bath is fully discussed and explained. From certain architectural analogies Dr. Koldewey thinks that the bath of Alexandria-Troas is of much the same date as the well-known Exedra of Herodes Atticus at Olympia (*i.e.*, about the middle of the first century A.D.). It thus forms an interesting link between the simple, early bath-structures of Assos and the luxurious complicated structures of late Roman times.

ADVICES from Panama of the 5th of May are to the effect that the dry season has not been healthy. Marsh fevers have prevailed, the majority of the victims being between eighteen and twenty-five years of age. Twenty-three sections have been organised, including workshops, *chantiers*, and *terre-plein* sheds, on which the preliminary works are said to be nearly completed; and the actual excavation has extracted, up to March last, between five and six millions of cubic yards. It is expected that this quantity will be trebled next year, as more dredging and excavating machines will by that time have been delivered. The sum expended up to the present time is stated at between six and seven millions sterling. This is in accordance with the fact that half of the "constituted capital" of 12,000,000*l.* has been called up, and a loan of 1,000,000*l.* raised. The actual work done is, therefore, only about 5 per cent. of the excavation for the line of canal, which was estimated by a Commission of the Academy of Sciences at 100,000,000 cubic yards. Nor is any thing said as to the commencement of the great dam near Matachin, which is to contain 26,000,000 cubic yards. How the difference between the "constituted capital" of 12,000,000*l.*, and M. Voisin's estimate of 42,800,000*l.* is to be made up, is also left for the future to disclose.

SUGGESTIONS have been made in some quarters as to the advantage of following the primitive rather than the Mediæval type in the construction of Liverpool Cathedral. Modern architects have hitherto thought themselves bound to reproduce, in varying combinations, examples of the Gothic idea, and the Basilica has been almost neglected: yet there is much to be urged on practical grounds in favour of the latter, which is, in fact, the earlier form, and was not unrepresented in præ-Norman England. It is not easy to understand the plans upon which the old English builders constructed their more important churches (for contemporary annalists indulged in language of poetical exaggeration), but the general features both of Wilfrid's Cathedral at Hexham and of Augustine's Church at Canterbury certainly resembled those of a Roman Basilica. Professor Willis has, in his "Architectural History of Canterbury," given a ground-plan of the original cathedral from Edmer's description, and it undoubtedly recalls the basilica of St. Peter at Rome. There would not, therefore, be anything out of the way in the idea that has been suggested. Perhaps a still better idea would be the adoption of a Greek Cross plan, with an open central area, like that which Wren wished to carry out at St. Paul's, as the best model of a Protestant plan. It would, too, be in thorough harmony with its surroundings at Liverpool.

AT the sitting of the Thames River Preservation Committee on the 9th, it was suggested by one witness, who was a riparian owner, and had been much troubled by invasion of pleasure-parties on his grounds, that public camping grounds should be provided at various places, where people should have a right to land. This really seems to us one of the most practical suggestions which has been made for meeting the rights and pleasures of all parties. Mr. Vansittart, who made the suggestion, seems to have acted with great forbearance in not interfering with a number of people who interfered very much with him, breaking his trees and making his grounds "hideous with litter of all kinds," and his business-like suggestion has, therefore, the more claim to attention.

THE Health Exhibition Conferences held by the Mansion House Council on the dwellings of the poor do not seem to have brought out anything very new as to the means of meeting the various difficulties connected with the subject. Mr. James Hole renewed the subject of the lateral extension of workingmen's dwellings by railway connexion, against which, as a solution of the problem, the weight of evidence has already been recorded, as we have remarked previously. The Vicar of Spitalfields demanded powers of legal interference and redress, most of which actually practically exist; another East-end vicar, the Rev. Septimus Buss, of Shoreditch, stated roundly, that in his opinion the law, as now existing, has full power to deal efficiently with sanitary matters; thus supporting what we have said all along since the agitation commenced, that the thorough application of the existing sanitary law should be the first step. The one new point in legislation which seems wanting is the power to inspect houses let out in tenements as well as "common lodging-houses." The Rev. George Murphy, of the London School Board, suggested that it would be a good thing to call a meeting of *bonâ fide* working men and have their views on the subject. Something might be struck out in this way, perhaps; it is noticeable that the one working-man who spoke at the meeting, Mr. Hunter, was clearly against the system of paternal government and building cheap dwellings at fancy rents for the poor; the working-classes desired, he said, the help and sympathy of the well-to-do, but they "would not be treated as mere machines." At a subsequent conference Mr. Ernest Turner read a practical paper on the arrangement of metropolitan houses, commenting on the want of attention to special construction for special classes of tenants; a report of this paper will be found elsewhere, and is worth attention.

WE publish elsewhere two letters, or portions of letters, embodying what we are to understand is the Liverpool view of the Manchester Canal question,—one by Sir W. B. Forwood, quoted from a Liverpool paper; one addressed to ourselves by the manager of a large shipping firm, and written partly in relation to some recent remarks in our columns on the subject, suggesting that Liverpool and Manchester should join hands in improving the Mersey estuary. Both writers understand, at all events, the commercial side of the question, and it will be seen that their position is that the work as proposed will in the end be injurious both to Liverpool and Manchester, in hastening the silting up of the mouth of the Mersey. The statement that there is 4 ft. less water over the bar now than there was seventeen years ago is, no doubt, a serious one. That, however, seems all the more reason for Manchester and Liverpool to join hands, as we suggested, in doing the best for the good of the estuary, in a matter which must concern both their interests, whether the canal be made or not. By the way, Sir W. Forwood falls into rather a confusion of language in talking of "the bar" as if it were the channel, and of the necessity of "maintaining" it. "The bar" is, as its name implies, the obstruction caused by silting up. What is to be maintained is not the bar, but the passage through or over it.

QUAINT CORNERS OF CAMBRIDGE.*

II.

"AN Athenæ Cantabrigienses, in its plan, correct; in its views, extended; in its literature, critical; in its principles and execution, generous," says Dyer in his "History of Cambridge," "might furnish half a score of students full employment for twenty years together." And a description of all the beauties of Cambridge would, if we substituted columns for years, require just as much energy; but the devoted antiquary alone could be found to write the one, while the most industrious reader of newspaper articles would scarcely be foolhardy enough to read the other. Debarred, then, of the selfish gratification of having in plain black type on paper all the sights that a short while ago were in living colours before us, it is only possible to recall some of those pictures whose characteristics were most powerfully marked. The picture of a town scene is loveliest when it combines the antique relics of past human skill with the bustle and life of the present: let us, then, review some of the best of the "quaint corners" of the various colleges in Cambridge, contrasting, as we do so, their time-honoured antiquity with the many-coloured web of existence which surrounds them.

Some of the most delicate art and picturesqueness in Cambridge is to be seen on the old gates of many of the colleges. Thus we have the handsome portals of Trinity, of St. John's, of King's; but these are too well known to need description, so let us pass to a little corner where there is a gate, not so well known, but which in its ruined state is far more pleasing than the others in their entirety. The point is one just outside the entrance of Clare College, with Trinity Hall on our left and the stately magnificence of King's Chapel on our right; the portal of Clare is behind us, and, if we turn, we look under it on to a snug college court and lawn, and through another portal down the beautiful avenue of the Clare grounds: before us are the various unfinished buildings of the university library and the geological museum, the entrance to which is the "old gate of kings,"—a splendid bit of workmanship, but never completed, because that portion of King's College to which it was to have been the portico was sold to the University, and the new buildings were erected on the other side of the chapel. It is a grey ruin now, and the idealist might clothe it in a sufficient air of romance to liken it to an uncompleted or an unrealised dream. A shade of sadness hangs over it; the skilful hand of the architect has been at work once and has laid stone on stone, and carefully fashioned delicate carving and tracing among its lines and mouldings, but just when the work had reached a stage at which it could show how beautiful it was going to be, it was destined to be touched no more, except by the softer touch of time, which has toned down its hard lines, changed its monotony of bright stone into a varied and rugged grey, trailed ivy up its unfinished columns, and planted stray flowers and weeds among its bricks. In the centre of such a quiet corner, it stands out to great advantage, although it seldom catches the sun upon its niches because of the tall buildings which surround it; unheeded by most who pass beside it, and particularly by the busy men of Clare, who see it oftenest, it just eludes the bustle and noise of the little thoroughfare a few paces farther down which runs into the King's Parade,—Senate House-passage. And here, again, we have a "quaint corner,"—a long narrow lane of university buildings. On our right, a portion of the library, and farther down the Senate House, where the examinations are held, or as the local rhymer called it,—

"That grisly hall . . .
Where all who live by victual go."

On our left the different parts of Gonvile and Caius College, the new part with its pointed turrets and pinnacles in the distance, and the old part with its ivied walls and delightful gates near at hand. Passing up and down is a constant stream of traffic, in which are conspicuous the "short-gowned" youths of the Hall; in the morning they may be seen at the strike of the clock rushing to their lectures; in the afternoon, when the less serious occupations of the day are done, walking demurely to their wonted exercise, and wearing upon them the black and white "blazer," the emblem of boating superiority.

Humility, virtue, and honour, such are the names of the three old gates of Gonvile and Caius College, and not alone does the moral quaintness of their nomenclature raise a smile, but their picturesque pretentiousness attracts a look of admiration, which architecturally we ought not to grant them. The gate of Honour is the prettiest of the three, and may be taken as typical of the *nimini-pimini* conceptions of the two others elaborated. It is built in that affected style of ultra-ornamentation which was imported from Italy in Elizabeth's reign, and went hand in hand with euphuism and the smaller charms of the Renaissance, which formed the "æstheticism" of that age. Yet, notwithstanding the false taste, the little old gate with its crown of ivy, its niches and mouldings of parti-coloured grey stone, and its half-corroded ironwork is worth being pleased about. It has a history as well as any of its statelier and more correct neighbours, and is it to be despised because it points to a less noble development of the taste of those who reared it?

The art of Cambridge is particularly happy in gates. Another quaint bit is the old gate that leads to the Bishop's Hostel, in one of the more secluded parts of Trinity College. Emblazoned with coats of arms and odd devices wrought in stone; it stands alongside of one of the earliest portions of the college, and the gloom of its surroundings is but seldom enlivened, except on Saturdays, when a crowd of Trinity washer-women with their big baskets and bundles of clothes, not alone give colour, but also verbal liveliness to the neighbourhood. Then, between Trinity and John's in Trinity-street stands another old gateway, with nothing particular to recommend it, except that, being entirely out of place where it is, it naturally looks very pretty, and with the loops and wreaths of ivy hanging over its square-cut blocks of stone, and with the long row of the buttresses of Trinity Chapel behind it, it forms an odd little corner in the busiest street of Cambridge.

Close alongside of this bit is another little peep, this time into St. John's College. Standing with our backs to the Divinity Schools, we look into the first court, with the chapel on the left, and the hall, built of deep red bricks, in the background, while all along in front is a double facing of ironwork, beautifully designed. This portion of Trinity-street and St. John's College is seen to most advantage just before dusk, when the last red tones of the after-glow shed their expiring warmth of light on the statues and marble columns of the chapel, while in the distance the lamps are just being lighted in the hall, and shine through a lofty row of painted windows.

And so on, we might get a view of every one of the colleges from some point whence they are not usually seen, and find corner upon corner to delight us, which we had formerly left unheeded. Thus we might draw enjoyment from the interior of Clare-court, particularly when in the autumn time the creeper, that grows round the windows of the hall, sheds its scarlet leaves; or we might take a look at Jesus College from Midsummer Common, and mark the various gaps between the trees of the close, through which we could gaze at the old college, with its homely red bricks, half covered with ivy, and surrounded by flowers and fields, looking, for all the world, like a pleasant country manse with a little village church beside it; or we might see the loveliest view of King's Chapel by looking at it from the Fellows' Gardens, where the trees fashion around its crowned spires a perfect frame of leaves and branches; or again, we might imagine ourselves back in the fourteenth century when we visit the aged bits of Corpus, in those days Benet's, College, and recall the times of the great "town and gown" contests, when not only noisy undergraduates and idle shop-boys, took part in the "rows," but mayor and aldermen and burgesses on the one side came out acudgelling with provost, dons and fellows on the other; and, what is more, provost, dons, and fellows got the worst of it, while, as the historian pitifully remarks, "they,"—i.e., the mayor, aldermen, and burgesses,—"went into the market-place, where with clubs they brake the seals of the University charters, and then burned them in the place. One Margaret Sterr, a mad old woman, threw the ashes into the air, with these words:—"Thus, thus let the learning of all scholars be confounded!"

"Quaint corners," there are, enough and to spare, whether we see them in the red chimneys of Magdalen or in the dark courts of Peterhouse; among the chequered shadows cast by the ironwork of the Bridge of Sighs at John's, or among the varied fragments and buildings of Pembroke, or even from among the class-rooms at the side of Trinity Gate, where no one

ever seems to go. But perhaps there is no college that has in it so many quaint bits as Queen's, situated exactly on the river. The back portion of it is joined to the other side by an old wooden bridge, called Sir Isaac Newton's Bridge. One day, so runs the story, the sage thought he would build a bridge that should puzzle everybody. Whether he was an undergraduate at the time the story does not say. It would be a strange thing nowadays to see an embryo Newton squatting on the banks of the Cam and ruminating on the construction of a bridge across the river. However, that is not the point, so he set to work, and constructed a diabolical piece of mechanism, which was so adapted as to fit together without the use of a single nail, and which was such that every beam bore an equal weight, and which was also such,—and this the sage, probably from a morbid desire for mischief, did not state,—that if once taken to pieces it could never be put together again. Many years elapsed, and long after the sage had become petrified and posted on a fine marble pedestal, to listen without flinching or yawning to the daily services of Trinity Chapel, the dons of Queen's thought that, somehow, their bridge required repairing. Many skilful artisans were thereupon employed, and the bridge was soon taken to pieces. At this juncture of the story comes a statement which, in all probability, is mythical; that the eye of the statue in Trinity Chapel was seen to wink. However that may be, the many skilful artisans continued their work; they cleaned, and polished,

* See p. 817, *ante*.

and repaired, until they came to the last stage, the refitting, when it was found that,—

"All the queen's scholars and all the queen's men
Couldn't put Humpty-Dumpty together again."

The fellows and dons were consulted, but not even the offer of an additional scholarship of 30*l.* a year brought forth the required mechanic, while the ghost of Newton was invoked in vain. Ignominiously baffled, the authorities of the college made a deep-laid plot, by which the bridge was *nailed* together, and the nails covered with tin and painted over to look like wood; and thus may they be detected to this very day by all who are let into the secret of the story. From the end of this famous bridge and the garden to which it leads, called the Grove, we realise how very charming the back of Queen's is. Looming over the river, the old walls with their brown bricks, their half-pointed windows, and their many chimneys, cast a deep shadow into the

Cam below; while in some portions they are overgrown with ivy, which hangs in long tangles down to the water's brim, and wall-flowers, which make a charming effect with their bronze and golden colouring. Passing over the bridge and into the college we enter a court or rather a cloister, the quaintest of the quaint, built of red bricks and projecting stories of yellow plaster; it forms an irregular square around a neat green lawn. The arches are low and plain, and, as we pass along and look from underneath them, we see all the various little charms with which the old place is rich; here a strange wooden tower, there a huge sun-dial; here a row of steps, and there a flash of sunlight thrown in from a neighbouring triangular court. It needs but a few sandalled monks to pace along its corridors when the vesper-bell tolls, and the true being of the College is complete. The bright-coated, stiff-collared undergraduate of to-day is utterly out of place in the solitary cloister of old Queen's. No place harmonises better with the idea of learning than this fragment of Mediævalism, with its crooked windows and snug little rooms. They knew how to make themselves comfortable, those old monks, and so did the good-humoured and venerable author of "The Praise of Folly," although, as he pathetically pleads in his letters, he found the college ale so very unpalatable. Up in one of the towers Erasmus had his room, high up, in order that he might have good exercise in mounting the stairs, and, as the historian gravely remarks, "perchance, on purpose to exercise his body and prevent corpulency," but more probably because he loved to look out of his study window on to the pleasant little bits of the old University town; and, no doubt, he chose to reside at Queen's because, with all his grand dreams of advance in learning, and notwithstanding all his scholarship and the Greek books that his friends sent him, together with the occasional and most acceptable present of a flagon of wine to make up for the sour beer, he too loved the "quaint corners of Cambridge."

The Botanical Gardens at Schonbrunn. This favourite resort of the Vienna Population has lately received an interesting addition in the shape of a large palm-house, which is favourably spoken of in the local press.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

PRESENTATION OF THE ROYAL GOLD MEDAL.

THE last ordinary meeting of this Institute for the present session was held on Monday evening last, Mr. Ewan Christian, president, in the chair.

The Secretary (Mr. W. H. White) announced that the Conference at the Health Exhibition, under the auspices of the Institute, had been postponed to the 10th, 11th, and 12th proximo.

The following gentlemen were balloted for, and declared to be duly elected, viz.:—

As Fellows.—Messrs. A. E. Johnson, Melbourne, Australia; P. M. Dudgeon, Natal, S. Africa; T. Rowe, Sidney, N.S.W.; T. S. Archer (Associate), Gresham-buildings; T. L. Watson, Glasgow; and F. Wheeler (Associate), Cheapside.

As Associates.—Messrs. A. B. Wilson,* Brisbane, Australia; C. Mason, Borough Engineer's Office, Nottingham; J. A. Williamson,* Edinburgh; J. B. Phillips, Epsom; J. A. Saunders, Folkestone; J. M. Kennard, South Lambeth-road; H. J. Price, Nottingham; F. J. Banister, Great James-street, Bedford-row; L. T. Waller, High Wycombe; A. W. Anderson, Warwick-gardens, Kensington; R. J. Beale, Tottenham; A. McGibbon,* Glasgow; R. M. Hamilton, Christchurch, New Zealand; A. Crow, Stratford; T. F. Pennington, Hungerford-road; W. H. Radford, Assoc. M. Inst. C.E., Borough Engineer's Office, Nottingham; and S. H. Seager, Christchurch, New Zealand.

As Honorary Associate.—Mr. C. B. Birch, A.R.A., of The Studio, Chelsea Bridge-road.

The following gentleman was elected by acclamation, viz.:—

As Hon. Corr. Member.—M. Alfred Nicolas Normand, Inspecteur-Général des Bâtiments-pénitentiaires de l'Etat, 51, Rue des Martyrs, Paris.

MEDALS AND PRIZES.

The President.—Gentlemen, you are, of course, all aware, that at this, the concluding meeting of the session, it is usual to present the Royal Gold Medal to the person selected for that honour, approved by yourselves and by her Majesty the Queen, in whose name it is given. You are also aware that this year the choice has fallen on Mr. Butterfield; but many of you may possibly not know, and it is therefore right I should explain, that while thankfully accepting the proffered honour, Mr. Butterfield said that it would be so inconsistent with the habits of his whole life to appear in person publicly to receive it, that if that were a necessity he must regretfully decline. Considering that personal appearance had, in other cases, been dispensed with, the Council were of opinion that this difficulty need not bar their decision as to the man. I thought it my duty, however, when, by your kindness I was elected to the chair, to represent to Mr. Butterfield how great would be our pleasure if he would allow us to welcome him here; but having, I confess, very much sympathy with his feeling in this matter, I could not venture to ask for a change in his decision. Personally I fear I must say that I rejoice in his determination, because standing here as your representative, I know how trying it would be to have to say in his presence how much I respect, both as a man and an artist, the subject of your choice. I know no man whose whole career has been more truly honourable or any one whose work as an architect has been more thoroughly consistent with the quiet dignity so characteristic of his life. In the great movement for the revival of Gothic architecture there have been, according to my view, amongst others less pronounced, at least two types of men who have achieved eminence as practising architects. The prominent leaders of the cause, men of great mental and physical power, indomitable energy, and restless love of work, could not fail to attract general and popular attention, but not less important to the success of such a movement have been the quiet, studious hard-workers, men of not less genius than the others, who in parallel lines have done so much to advance the knowledge and sound practice of the art. Of the former type two have accepted the medal, and, to our sorrow, have successively passed away to their rest. Of the latter one has received it and is still with us, but the roll of Gold Medallists would indeed have been incomplete had it lacked the name of William Butterfield. In him we must all recognise a true master of his craft, one who not only knows well the art he practises, but whose works from first to last, whether small or large, whether in the quiet country village or in the great city, whether in the small school-house or in the grand university college, all bear uniform testimony not only to the skilful design, but to the earnest, loving care which he always bestows on every detail. It has been my good fortune to see many of Mr. Butterfield's buildings, and I can truthfully say that I have never looked upon one of them without that refreshing sense of satisfaction which good work well carried out must always inspire in those who can appreciate it. Gentlemen, I hope I may count upon your sympathy in saying what I often think, that the world at large shows too little gratitude to those who minister to its improvement or its pleasure. Just as I think the poet, the great writer, the musician, the painter, should be thanked for the gratification which each in his vocation affords, so no less should the great architect; yet who ever thinks of giving him his proper mead of praise? Who ever thanked Sir Christopher Wren for his noble works in the City of London; the churches, towers, and spires with which he beautified it, or the magnificent cathedral, with its glorious dome, its crowning glory? We know too well how the great architect's last days were embittered by the persecutions of men in office not worthy to tie the shoe-strings of the master; yet what a poor mean place would London have been but for the workings of his fine and cultivated genius? Many times have I wished that I might have lived in Palace-yard under the shadow of Sir Charles Barry's noble clock-tower; and of many another work I could probably say the same. Truly, I think if any man earns the gratitude of nations, it is the great architect whose works are for all time, an honour to his country; visible to every one who takes the trouble to see, or has the mind to appreciate, the beautiful in art; and for this reason I think we have done well in offering to Mr. Butterfield the greatest honour it is in the power of this Institute to bestow. If it be true, as I hold with the poet it is, that "a thing of beauty is a joy for ever,—its loveliness increases, it will never pass into nothingness," then, I think, we may joyfully thank Mr. Butterfield for the dignified work of his early years; the graceful and beautiful spire, and the vigorous, yet sumptuous, interior of his noble Church of All Saints, Margaret-street; and lest I should weary you by a bare recital of his works, I will pass over many others, each possessed of the power and beautiful form of which he is so great a master. Glancing only at the noble church of St. Alban, Holborn, and the fine church of St. Augustine, South Kensington, I will stop at the great crowning work of his maturer years, the magnificent and richly-finished chapel of Keble College, Oxford. In each and every one of these there is to be seen, though with great variety of composition, the same noble conception of dignified form, the same careful study of every detail for producing general harmony of work; and while fully availing himself of the richness derivable from the subsidiary arts, in choice stained glass, mural painting or mosaics; the same powerful mastery fuses the whole, and subordinates everything to the architect's design. While possessing, as he does, a profound knowledge of the works of the great architects of old, and availing himself of the numberless resources which they so copiously afford, Mr. Butterfield's genius has enabled him to work in a style peculiarly his own; never slavishly copying, but moulding in his own mind whatever he desired to employ in carrying out his work, and though opinions may and will differ on matters of taste, none can certainly deny that his works are those of a refined and cultivated gentleman, and a most able, original, and accomplished architect. Finally, gentlemen, I think I have said enough to show that our medal on this occasion has been worthily bestowed; and I trust I have not wearied you in dilating, possibly too long, on what has been to myself a very genial theme. As Mr. Butterfield is not able to attend this evening he has deputed Mr. Penrose, who is the Gold Medallist of last year, and a worthy predecessor, to receive it for him. Therefore I shall have the great

* Of the Associates whose election is here announced, those whose names are marked with an asterisk passed the Obligatory Examination in Glasgow; the rest passed in London.

pleasure of handing to Mr. Penrose this gold medal, and at the same time I will hand him a copy of the remarks I have made in presenting it.

Mr. Penrose.—Mr. President and gentlemen, under the circumstances that have been mentioned to you, I have no occasion to say much. I consider it a very great honour that Mr. Butterfield has reposed in me in asking me to be the medium of presenting this medal to him. I shall endeavour to convey to him as soon as I can see him the great enthusiasm with which you have received the President's excellent remarks, which happily I have here in my hand, and which will save my memory being taxed in the conveyance of them. Under the circumstances I believe I may conclude with thanking you all, gentlemen, in Mr. Butterfield's name, for the gift you have conferred upon him.

The President then presented The Soane Medallion (with 50*l.* to be afterwards paid under the usual conditions) to Mr. John Oliver Harris. In doing so he spoke strongly of the necessity for young architects seeing the work of other nations as well as those of their own country. In the same competition, a medal of merit was also awarded to Mr. Herbert O. Cresswell.

The Tite prize of 30*l.* was awarded to Mr. Edwin W. Poley, Associate, the President adding that they had been waiting for some years for a successful candidate for this prize. Sir William Tite was a great lover of Italian architecture, and though he (the President) did not quite sympathise with him on that subject, still the pursuit of the beautiful was always of advantage to the architect. A Medal of Merit and ten guineas were also awarded to Mr. John A. Campbell in the same competition.

The Institute Silver Medal and ten guineas were awarded to Mr. A. W. Anderson for drawings; also the Institute Silver Medal to Mr. A. N. Wilson; a medal of merit to Mr. J. R. Sutton; and certificates of honour to Mr. A. B. Mitchell and Mr. Henry Downs.

The Institute Silver Medal and ten guineas were won by Mr. T. P. Marwick, Associate, for an essay. Mr. Marwick is the first Ashpitel Prizeman in the Obligatory Examination.

Mr. J. T. Wood, F.S.A., next read a paper "On the Temple of Diana at Ephesus," a summary of which, together with a report of the discussion which ensued, will be found on another page.

THE TEMPLE OF DIANA AT EPHESUS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the meeting of this Institute on Monday evening last, Mr. J. T. Wood, F.S.A., read a paper on "The Temple of Diana at Ephesus." He began with a general statement of the difference between Mr. Fergusson's Restoration of the Temple of Diana at Ephesus and his own. So material was the difference between them that he had felt bound to submit to the judgment of the Institute both plans drawn to the same scale, but in no spirit of antagonism. When in 1863 he set himself to unearth this glorious building, which was reckoned one of the Seven Wonders of the World, he had not forgotten to study beforehand the few ancient authorities on the subject, especially Pliny, in whom, considering that the Roman writer never saw it, Mr. Fergusson, strangely enough, so implicitly confided. Clearly we must reject any of the dimensions given by Pliny which were found irreconcileable with the data acquired by excavations. By this rule Pliny's figures for the width of the temple platform were condemned as inexact. The true width was 239 ft. 4½ in. But Pliny's 425 Greek feet for the length was borne out by the excavations. Mr. Wood thus got, he said, ample space for one or more altars, as well as for marshalling such processions as that described in an inscription found in the Great Theatre. Mr. Fergusson suggested an arrangement of the steps in broad and narrow flights, which, Mr. Wood argued, was inadmissible. It was further shown how, in the investigation of these and other details, he was brought into contact with the *débris* of every one of the three successive temples which had occupied the site. The earliest of the three was that begun towards the middle of the sixth century, before the Christian era, under the architects Chersiphron and his son Metagenes, and to which the Lydian King Crœsus so liberally contributed. This temple appeared to have been adorned with sculptured columns, as fragments of archaic bas-reliefs attached to a rounded surface were found on the site, and were now to be seen in the Archaic Room at the British Museum. A large lion's head, and some other fragments of antique sculpture, found in some foundation piers of a later age, must have come from the earliest of these three temples. The second temple was begun in the early years of the fourth century by the architect Paionios. The last temple was begun in the time of Alexander the Great, and must have been already far advanced when he came to Ephesus, since he proposed that he should be allowed to dedicate it to the goddess in his own name. Mr. Wood said he had ventured to place two altars on the platform at the western end, one for animal sacrifices, and the other for such offerings as the fruits of the earth. In his account of the *cultus* of the moon-goddess, to whom, as well as to her brother, the sun-god, human victims were anciently sacrified, Mr. Wood said he was largely indebted to the erudition of Professor Paley, who thought that the great statue must have been hypæthral, because it was an object to let the moon shine straight upon it, and that it would stand close to, and, as it were, preside over the principal altar. Mr. Wood mentioned a suggeston of his own in conversation with Mr. Fergusson as to the Hypæthron, that these openings in the roofs of temples harmonised well with the ancient Greek belief that the gods floated in the air, and would at times descend thereby into their temples. Mr. Fergusson's reply was, "Let them walk in at the door like other people!" Mr. Wood next pointed out the monumental verifications of his views as to the width of the temple itself and to the position he had assigned to the columns. He explained why he had not felt at liberty to make such a restoration of the Temple as would better satisfy the desires of those who, with good reason, imagined that groups of sculptures, bas reliefs and statues, in addition to the sculptured columns or frieze, were needed to account for the lavish admiration bestowed upon this world's marvel by the ancient writers. He stood in awe of the peril of dwarfing the grandeur of the building. He had, however, ventured to put statues on pedestals against the cella walls. One of the most important points of difference between Mr. Fergusson and himself was in respect of the number of external columns. He accordingly vindicated his own punctuation and rendering of the Plinian text, "One hundred columns, twenty-seven the gifts of kings." This, he contended, was more correct than the removal of the comma and making Pliny say there were "One hundred and twenty-seven columns the gifts of kings," as Mr. Fergusson did. Room had been found for one hundred columns, but not for more, and if there had been one hundred and twenty-seven they could not all have been given by kings. Rich private individuals and communities would give some, and he himself happened to find part of the base of a column, showing that it had been given by a Sardian lady. The most interesting feature of the Temple must have been the sculptured columns, thirty-six in number. To an account of these, of the Temple volutes and architraves, as also of its cymatium and marble roofs, the remainder of the paper was devoted.

The Chairman (Mr. Ewan Christian, President) was sorry Mr. Fergusson was unable to be present owing to illness, but he had seen an abstract of Mr. Wood's paper, and had sent some observations in reply.

The Hon. Secretary then read the following letter:—

"I regret extremely that I am unable to be present at the meeting of the Institute this evening, as I should have liked much to have had an opportunity of explaining personally why I differ so essentially from Mr. Wood regarding the restoration of the Temple of Diana at Ephesus. It would also, of course, have been advantageous that I should have heard all that he has to say on the subject before attempting a reply; but I have before me an abstract of his paper, prepared for your Proceedings, which is quite sufficient to enable me to understand the principal points of difference between our two restorations. In the first place, I object *in toto* to his arbitrary insertion of a comma, where none exists, into a singularly plain sentence of Pliny's, but which alters its sense entirely, and, so far as I can see, makes it read very like nonsense. As it stands in the text, it simply says, 'There are one hundred and twenty-seven columns' (in the peristyle of the Temple), 'the gift of several kings.' Alexander offered to give the whole, if allowed to dedicate the temple to the goddess in his own name. His offer was rejected, but other donors, not necessarily kings, as we understand the term, supplied his place, each giving according to his ability. Of course when a sentence seems perfectly inexplicable, or at variance with facts ascertained in excavation, the insertion of commas and stops, or even alterations of the text, are allowable, but only as temporary suggestions to get over what appear to be insuperable difficulties. When, however, it dawned upon me that thrice nine made twenty-seven, and when on protracting them I found that nine pillars, with the usual intercolumniations of 16 ft. 4 in., made up the same dimension that was occupied by the widely-spaced eight columns of the front, the riddle was guessed and the problem solved. When worked out, as shown in the plan published in your Transactions, it was found that not only did every dimension quoted by Pliny come out exactly correct, but every paragraph bearing on the subject in Pliny, Pausanias, Strabo, or any author in ancient times, was verified and confirmed. The only wonder to me is that Mr. Wood did not at once adopt this suggestion, which got him not only out of his translation difficulties, but rendered the temple he had discovered with such infinite labour so much more worthy of the character for magnificence which it bore throughout the ancient world. Instead of this he adheres to a plan in which only one dimension comes out correct, and that not ascertained by excavation, but adopted from Pliny. In the only plan he has yet published it is quoted as 418 ft. 1½ in., as ascertained by excavation; he now adopts 425 Greek feet (430 English), which is the dimension for the length given by Pliny. It is strange that while Mr. Wood will not allow that this author could count the columns, which were then all standing, and their number a matter of notoriety known to all the world, he should admit that he could measure the length of the temple, a very much more difficult operation, to within 1 ft., though he failed, according to Mr. Wood, to ascertain the breadth, 220 Greek feet, which being about half the other, was certainly an easier operation. Not only did the adoption of 127 columns get over all the difficulties regarding the dimensions quoted by Pliny, but the very much more serious one that all antiquity declared the temple at Ephesus to be the largest as well as the richest in all Asia. Pausanias, for instance, says (Book VII., ch. v.) that it is larger than that at Didyme, whose dimensions are perfectly well known. It had 120 columns 64 ft. in height, while Mr. Wood represents that at Ephesus as possessing only 100 columns, and their height as only 55 ft. 8 in., a fact which, it seems to me, is quite sufficient in itself to settle the question. One of the arguments on which Mr. Wood insists is, that he found a 6 ft. length of the lowest step of the podium in such a position that there is no room for my 127 columns. There may be fifty ways of accounting for such a trifling fact, but that I have suggested in my paper is quite sufficient. Strabo's account of the addition made to the temple after it was finished by Chersiphron, not only suggests, but seems to require, such a buried step. But I do not see that Mr. Wood has turned his attention to this, or attempted to explain the passage otherwise. In fact, the Institute have now before them two plans of this famous temple, one of which professes to explain every dimension handed down from antiquity, and to reconcile them with every discovery Mr. Wood made on the site, and to offer a reasonable explanation of every fact mentioned by any ancient author. The other does not pretend to agree with any passage in any writer of antiquity, except by a forced and most onerous mode of interpretation, nor to agree with any one dimension given, except one which was not ascertained by excavation, while from the smallness of its dimensions it contradicts all history. I cannot quite make out whether Mr. Wood still adheres to his theory that the heavy blocks, carved on two faces, are parts of the frieze of the Temple, or are square pedestals of certain of the pillars, as I suppose; but as the blocks are now arranged in the Ephesian Gallery of the British Museum, any architect can judge for himself, and I shall be excessively surprised if any one agrees with him. In the meanwhile it would assist materially in settling the question if he would let us know where they were found. As there are certainly four, probably five, of them, they must, if parts of the frieze, have been found near the four angles of the Temple. As far as I can make out from his published work, this was not the case. When he puts into tangible form his ideas of the hypæthron, it will be time enough to consider them. Till he does so I can only say, with all due deference to the learning of Professor Paley, that those expressed in this paper appear to me only as examples of a hazy mysticism which I am astonished that any practical architect should adopt. JAMES FERGUSSON."

Mr. Penrose.—I have not seen the excavations on the site of this Temple at Ephesus, but I think we should be extremely thankful to Mr. Wood for the energy he has displayed. I wish he had been able to go nearer to the statement of Pliny and his description than he has shown, in the paper read this evening, that he is disposed to do. In this respect I must hold with Mr. Fergusson. I think Mr. Fergusson's working out of the 127 columns is remarkably ingenious. Mr. Fergusson claims the change in the design in consequence of the

hill which rises eastward from the Temple. I should be glad to hear from Mr. Wood, from his knowledge of the spot, whether he considers that the hill comes so near the Temple as to make the view of the front of the building comparatively unimportant; or has it a gentle slope which would not materially modify the aspect of the Temple?

Mr. R. P. Pullan.—I was not there when the Temple was thoroughly excavated, but was at Ephesus several times before Mr. Wood made his discoveries. I am glad to find that Mr. Wood is about to publish details of his discoveries, because it is perfectly impossible to make a restoration unless every stone found is measured and the measurements published. I have had some little experience in digging up temples and making restorations of them, and it is my practice to measure every little stone found in every possible place, for a missing link would spoil the whole of the restoration. In Ephesus there were very few remains found, but it is to be hoped some part of the pavement will be found, because the pavement is a great guide as to the position of the columns. Even if half a dozen steps were found it would give some idea of the places of the columns. Mr. Wood has worked hard for years at this exploration, and is deserving of our thanks. If Mr. Fergusson's idea is the right one, then I must say this temple must have been a *lusus templorum* if it were like Mr. Fergusson's design. There is only one point on which I would criticise both Mr. Wood's and Mr. Fergusson's restorations. I have dug up three Ionic temples, and in no case did I find anything like sculpture on the pediment.

A vote of thanks was then passed to Mr. Wood for his paper, and the meetings were adjourned to the first Monday in November.

IN NORTH-EAST HERTS.

THE cave at Royston, being a great rarity, a goodly number of people go into it every year. The St. Alban's Architectural and Archæological Society visited it recently,—in the course of a day spent pleasantly in a look at Royston, and a drive up the hills to Therfield and over to Anstey. The so-called cave, which resembles in the main a circular-domed water-tank, is about 17 ft. diameter, and the height from the floor to the surface of the street above it is 28 ft. The grated eye, just by the side walk, was pierced through the crown probably at the end of the last century; it did not exist at the time of the discovery in 1742. Then, and till 1790, the only access was by the shaft now to be seen from below. In 1790 a bricklayer employed his workmen during a hard winter in making the inclined way, 72 ft. in length, cut in the chalk,—which now affords very comfortable access from the side of a gateway on the opposite side of the Ikenhilde or Icknell-street,—the Icknield Way in fact, part of the very old road from the eastern counties to the south-west. For about a couple of miles east, and four miles west of Royston, it now marks the line of division between Cambridgeshire and Herts. In 1742 the "Mercat House" stood above the cave, and a post was wanted, according to Stukeley's detailed account, "to nail a bench on for the use of the market women." The men came on a stone with a hole in it, then on a shaft about 2 ft. in diameter and 16 ft. deep, and then on a cavity filled with loose earth, of which they cleared out 200 loads. The Rev. George North, Rector of Codicote, went there before the clearance was completed, and reported to the Society of Antiquaries; and Dr. Stukeley that "mixture of simplicity, drollery, absurdity, ingenuity, superstition, and antiquarianism," as Warburton affectionately wrote of him after his death (1765), went down shortly after, found it cleared of earth, went again, made sketches, and the next year his "Origines Roystonianæ" was published.

Camden, without naming any authority, had attributed the erection of the old cross which formerly stood at the junction of Ermine-street and the Icknield Way, to Lady Rosia,—thence getting Royse's Cross, Royse's Town, Royston. This may have been local tradition or conjecture. At present the erection of the original cross is by the best conjecturers fixed at a time before the Conquest. Stukeley made the Cave, —"the Oratory of Lady Roisia, Foundress of Royston,"—and explained in a fitting way the intention of the sculptures which surround it to a height of 8 ft. from the floor. These sculptures are in flat relief,—the chalk which holds together fairly having been cut back round them. Many are still in good preservation, probably much the same as they ever were, barring the loss of the colour which was applied to parts, if not to the whole. A very careful examination of them all was made about thirty years ago by Mr. Beldam, the modern authority on the subject; and vestiges of red, blue, and yellow were visible in various places;—the relief of the figures had been assisted by a darker pigment. They are not to the same scale, nor apparently connected in subject, nor arranged according to any scheme. They are dotted about on the wall,—no doubt not done all at once,—perhaps done by different people, with different degrees of skill, none very skilful. Stukeley's "imagination fougueuse, qui lui faisait commettre les erreurs les plus fantasques," led him to a comparison between the Bayeux tapestry and the Cave, and to the following climax:—

"And as Montfaucon's tapestry is indubitably the noblest monument of *English* antiquity abroad, so is our *Roiston* cave the noblest monument of English antiquity that is in England, or that has been discovered in our time."

We see by means of the Stukeley papers, now being edited by the Rev. W. C. Lukis for the Surtees Society, that the Doctor had in August, 1744, a private suspicion that his tract had been a little too effusive. At that date he wrote to S. Gale:—

"The Doctor [Knight] told me that it was one *Parkyns* who is writing against Lady Roisia. As I only write to please and to amuse myself as well as others, and did not bestow more pains than are proper in such matters, I shall not discompose myself to answer such a sorry trifler, who has nothing else to doe than to contradict things of no importance to mankind."

When "An Answer to, or Remarks upon, Dr. Stukeley's Origines Roystonianæ" was published the same year by the Rev. Charles Parkin, Stukeley did not take things quite so calmly. Parkin seems to have been irritated by Stukeley's assuming a sort of property in the Cave, making too much of it, and interpreting the sculptures in too secular a way; also generally by a desire to take the other side. Stukeley, like a true champion, made Roisia's cause his own, and fought fiercely in her honour. The rebellion of 1745 stopped the publication, but in 1746, 135 closely-printed pages came forth "in defence of Lady Roisia de Vere against the calumny of Mr. Parkin"; not that Parkin had spoken worse of Dr. Stukeley's lady than to say that she had probably nothing to do with the oratory, and could not have been buried there as asserted, it being on record that she was buried elsewhere. Since 1746 no one has contended that Lady Rosia executed the sculptures personally. E. Smalwell, writing from Lynn [Parkin was a Norfolk man] in March, 1745, reported to the Doctor after investigation, as to the character of "Perkins, that imposter and usurper." Such loyal support of a friend is beyond praise. The Rev. G. Burton, reporting in 1747, was more moderate, only finding "Parkins a designing, wicked, and faithless wretch." The varied nomenclature of the wretch is evidently no wreaking of vengeance on his name; that refinement is mainly a modern improvement due to more orthography, which has made loose spelling a crime or an intentional insult. Mr. Lukis remarks in his preface on Stukeley's pleasant freedom from all irksome rules, his words take the form convenient at the moment. Parkin was, no doubt, a very worthy person. Blomefield, in his preface to the "Norfolk," thanks "the Reverend Mr. Charles Parkyn, Rector of Oxburgh, for pains and great assistance, which can never be sufficiently repaid." Before the completion of his third volume Blomefield died, and Parkin carried the great work to completion. The Surtees Society's publication gives us an unexpected and slightly unfair glimpse behind the scenes. Masters was working at his history of Corpus Christi College, Cambridge; and the Druid Chyndonax, as Stukeley proudly called himself, supplied authentic notes to assist in the writing of a memoir of a distinguished member of the college:—

"He published the account of Lady Roisia's sepulchral cell lately described at Roiston. 1745,—one Mr. Parkyns took it into his head to make an awkward answer (as he calls it) to Dr. Stukeley's account being an unhandsom treatment of the Doctor, and an unconnected, odd account of that antiquity of his own. The Doctor answered it, but on account of the Rebellion deferred the publication till 1746."

A pensive smile must come upon the face of the reader, who observes how this was "boiled down" for the actual publication in 1753. In the interval (1748) Parkin had published his "Reply to the peevish, weak, and malevolent Objections brought by Dr. Stukeley. . . . . Royston proved to be an old Saxon Town, and the History of the Lady Roisia shown to be a meer Fable and Figment." The concluding allusion in Masters is jaunty:—"Mr. Parkin replied in 1748, but I don't find that the Doctor has taken any further notice of him." The Rev. Dr. Griffith, of Sandridge, touched but lightly on these instances of self-sacrifice,—bent upon making examples for us and assisting in the formation of our opinions. Addressing the visitors in the Oratory, he stated that he was disposed to adopt several of the conclusions of Mr. Beldam. The first shafts may have been sunk in the times before the Romans; it may then have been used as a Roman sepulchre. Being enlarged to its present size,—most of the carvings were done in the reigns of Henry II. and Richard I. There was a William de Magnaville, the favourite son of Stukeley's Lady Rosia, who was with Richard in Palestine, and who may have had something to do with the selection of subjects. It may have been an oratory before that time, perhaps attached to a hermitage. After the Reformation somebody felt satisfaction in filling it up with remains of the Priory buildings;—in the course of, perhaps, 200 years after the filling up all remembrance of it had been lost. We would add that there were rivalries in those days also; and that, unless this one was poorly appreciated, discoveries of other caves may yet be in store;—some contemporary notice of this cave may also be unearthed some day, to the gratification of all those who are only moderately satisfied with possibilities and conjectures, however ingenious.

In Royston Church, which was next visited, there are three Early English windows on each side of the chancel, of rare beauty and richness, sadly mutilated as the result of after-changes; well-moulded piers in the arcades, the remains of an Early Perpendicular screen used up in the pulpit and desk, and some brasses. The Rev. H. Fowler read a careful and most interesting paper, from which we make a few extracts:—

"This church is in Hertfordshire, in the ancient Hundred of Odsey, not many yards from the old British track of the Icknield Way, which at this point is identical with Melbourn-street, and passes along on the line of Baldock-street. It crosses the Roman military road of Ermine-street at the point where the ancient cross stood, and is the boundary line between Herts and Cambridge. Previously to the institution of the vicarage in 1540, we are told that the town was situated in five parishes. The town of Buntingford, about eight miles south, is in several at the present time. I am not sure whether those at Royston all met at the ancient cross. Leland says:—'There touche, as I lerned in that towne, jurisdiction of London, Ely, and Lincolne diescese.' In early Saxon times the cave, with perhaps a cross above it, may have marked a point in the boundary between the Mercian and East Saxon kingdoms. . . .

The oldest extant charter,—that of Richard I., dated Nov. 10, 1189,—confirms:—'To the monastery of St. Thomas the Martyr apud crucem Rohesiæ and to the canons there serving God, the site of the monastery and its appurtenances, which Eustace de Merc [query, March, Isle of Ely], the founder [c. 1180], and Ralph de Rowcester [Rochester], and other faithful men have reasonably granted to them.' Little is known of Eustace. . . . It is probable that there was always a close connexion between the oratory at the cross and the priory. The fame of the Hermitage might, indeed, have had something to do with the selection of the site of Eustace's monastery. . . .

The length of the choir, of two bays only, would be about 30 ft.; thus, with the return stalls, there would be accommodation for between twenty and thirty canons. The monastery belonged to the Augustinians. There were three other religious houses of this order in Herts, all small; and 175 in the whole of England. . . .

It appears that the inhabitants of Royston had the right or privilege of worshipping in the western portion of the church of the canons. Leland writing reg. H. VIII., states, 'in the towne is but one Chirche, the Este part whereof servid for the Priory of Chanons. The west ende servid for a Chapel for the towne.' We have seen something like this arrangement at St. Alban's and at Dunstable,—though in these cases it was an aisle of the nave or a chapel

annexed to it which was so used. At Dunster, Somerset, it was decided in 1499, by the Abbot of Glastonbury, that the monastic choir should be resigned to the sole use of the monks, and that the parishioners should use the nave. At Sherborne Abbey, the parochial church of All Hallows was attached to the west end of the conventual church, the easternmost bay being a vestibule common to the two churches.

Clutterbuck and Cussans both state that a large arch, now covered up by the casing of flint, formerly existed on the western face of the tower; good evidence from the building that the church extended thence westward. Leland's statement runs, 'Now al the toune is allottid to one paroche and that ys kept in the este ende of the priory and the west ende is pulled down.' At Dunstable the eastern portion was pulled down or allowed to fall into decay. Waltham is another similar instance. At Hexham, the nave has been taken down, only a slip being left as an abutment to the tower, and the eastern part of the church has been retained as at Royston; and there are plenty of other cases in which a church, converted from conventual to parochial uses, has lost a limb. I conclude that the original priory church consisted of a choir with aisles, a sacrarium or chancel, central tower,—all which we see; and transepts and nave, which have disappeared . . . .

The site of the Priory was granted after the Dissolution to Robert Chester, of Barkway,—a member of a family which seems to have been prominent in the county for about two centuries,—from the middle of the sixteenth to the middle of the eighteenth century. The fabric of the church was reserved to the king. The Act of Parliament by which the vicarage was constituted (out of five parishes as mentioned above) in 1540 states:—'The church, of which priory the poore inhabitants of the said towne have bought to their great charges, to thintente to have the same their parrish churche, and therein to have daily masse,' &c. We are reminded by the wording of the Act that reformation in doctrine and ritual had not yet taken place. This was just after the passing of the statute of the VI. Articles, 31 H. VIII. (1539), repealed 1547; and the vicar was required to celebrate daily mass.

With regard to the monastic buildings,—they stretched along the south side of the church, extending probably nearly the whole of its length. They may have remained for some time after the Dissolution. When pulled down they were available for use in the large residence, called the Priory House, built by Sir Robert Chester. It is described in the report of the Commissioners of Queen Elizabeth as a large irregular mansion, about 35 yards long by 30 yards wide, having an outer and an inner court, and sixteen rooms on the ground-floor, including the kitchen. The queen thought of making a stay here, in a progress through the country in July, 1578, but the account given of the house was not sufficiently inviting. Dr. Stukeley tells us that in 1742 a fine kitchen was still standing, and various ruinous parts. The old wall of the precinct still remains, I believe almost entire, and encloses beautiful grounds. The modern house belonging to Lord Dacre is said to be on the site of the Priory barn. It was in the old Priory House that James I. was the guest of Robert Chester, son of the Sir Robert Chester,—in April, 1603, on his way from Scotland,—when he was so delighted with Royston that he determined to build the hunting-box, part of which remains in Kneesworth-street."

Of the hunting-box from which James set out so often for "shooting the dotterel and hunting the hare" very little now remains. Kneesworth-street was formerly Arnyng [Ermine] Street, it was so in 1610 when a survey was made of the late dissolved Priory and the whole parish of Royston. The few moulded beams and an underlighted panelled room, grained dark walnut, are regarded with little admiration by the occupiers. The exterior is now neat brick with red gauged arches and strings,—work which might belong to the last century, or equally well to 1812, when the property passed into private hands. This Palace (so-called) is in Cambridgeshire. James went out with the hounds about three times a week. It has been suggested that there was mischief meant, in pointedly mentioning the dotterel and the hare as the favourite prey of his Majesty. The dotterel was credited with much stupidity, getting his name from *dote*, at a time when that word was used not only for foolish fondness, but for folly without the fondness. The ape-like movements of this long-legged wader, a kind of plover, are, no doubt, diverting; but to a king fond of his "kingcraft," its simple manners, its want of fear of man owing to ignorance of his ways, would be, if possible, still more diverting. Drayton, on the sports to be made out of the gestures and simplicity, will be called to mind:—

> "The dotterel, which we think a very dainty dish,—
> Whose taking makes such sport, as no man more can wish.
> For as you creep, or cowr, or lie, or stoop, or go,
> So, marking you with care, the apish bird doth do;
> And acting everything, doth never mark the net,
> Till he be in the snare which men for him have set."

Charles I. was much at Royston in his early youth, but does not seem to have made much stay at this favourite resort of his father's after his accession. On the 24th June, 1647, he was at Royston, when brought from Newmarket in the custody of General Fairfax. This was the last occasion of his being there. The estate came to the Crown at the Restoration, and was finally parted with in 1812.

From the hills about Therfield the prospect over the flat land of Cambridgeshire and Beds to the north and west is extensive. Ely in a straight line is about thirty miles off, and Cambridge as near as possible half way along such a line. These hills are the division of the waters. The Cam rises about six miles north-west of Royston, near Guilden Morden, the parish containing the manor or grange of Odsey, from which the Hundred takes its name. Any one following the Rib, from its junction with the Lea between Hertford and Ware, will pass,—

> "To Withihall, to Buckland, and to Barkway both,
> Where is the head and verie utmost bound
> Of this surpassing cleere and goodly streame,—
> The greatest branch that feedeth christall Lee."

The little Quin, which joins the little Rib at Braughing, comes down from Anstey. Thus the water from the northern slopes of the hills reaches the Wash, and that from the southern the Thames. Therfield is Tharfield in local speech, and sometimes in print, as the rector, the Rev. J. G. Hale, stated in the course of a paper, well illustrated by old maps, books, documents, and views, read in the large rectory room, erected for use while the new church was building. The rectory, the residence of so many notable men, stands close by, a very comfortable structure in good grounds, with some remains at the kitchen end of an old house, mullioned windows, part of a circular turret, &c. The new church is pointed to as a piece of lasting work, done for posterity; some bits of the old church were preserved and worked in, and the inscribed beams and other fragments, not yet put into the new building, will no doubt go there shortly. The bells are at present in a wooden shed built round a large tree, as the church tower is only projected at present. No one doubts the insecurity of the old church; well-known views and photographs make that pretty clear, without comments. For the loss of some of its least-liked features, it is permitted nowadays to feel a slight regret. The chancel had, it is true, a flat plaster ceiling, with an oval centre and floral wreaths round; but it was a memorial by "an inconsolable husband to an incomparable wife," that is, by Francis Turner, who was instituted here in 1664, and lost his wife in 1677, aged 28. He was one of the seven bishops of 1688, deprived as a non-juror in 1690, and was buried here in 1700, "without any memorial except the word 'Expergiscar' engraven on a stone over the vault." Clutterbuck (1827) did not seemingly note the existence of the stone. Mr. Hale mentioned his distinguished predecessors in his paper: "Bishops held the living with their sees,—deans and archdeacons, canons residentiary from Durham to Exeter, Masters of the Temple, and heads of colleges."

After a drive of about six miles the party went up the moated castle mound at Anstey, reaching a carefully-kept bit of green sward, said to be a quarter of an acre in area, secluded from the world by the green leaves of trees planted on the tall slopes. The first castle was built in the eleventh century. In the thirteenth Nicholas de Anstie was ordered by Henry III. to demolish so much of the building as had been raised in wars carried on against his father. There had been trouble from it: the small mounds on the north may mark the site of the buildings which were pulled down. The rest remained until 1400. Now there is no trace of building above ground, though digging has revealed a bit of foundation. Canon Davys gave an address on the mound, and afterwards read a pleasant paper in the church situate just to the south,—a cruciform church, with central tower and short spire. Tower-arches of the Transition and a very early font remain. Materials from the castle may have been used elsewhere,—for instance, in the fine Early English windows in the chancel,—very nicely treated. The nave arcade is well moulded, small quatrefoil windows are packed into the spandrels between flat-pointed arches, a method of obtaining a tallish arcade and a clearstory in a wall of very moderate total height, more to be commended for its good intention than for its beauty as it stands. The buttresses round on plan on the lower stage, the fine hagioscopes from the transepts, the beautiful monument in the south transept, and the late stall-work should all be well noted.

In returning to Royston a glance was given at the church at Barkway, and at one or two houses in the taste just now so well relished, "and so home."

It is with sincere regret that we record the death on Sunday, June 1st, at the early age of forty-two, of Mr. Ridgway Lloyd, who was buried on the 6th under the shadow of the north aisle of the Abbey Church at St. Alban's, in the history of which he had taken so special an interest. Much sympathy was expressed at a business meeting held during the excursion on the castle mound at Anstey; but the fatal termination of the illness was, of course, quite unlooked for. He became one of the Honorary Secretaries of the Society in 1870. His archæological studies,—pursued constantly and with ardour in the intervals of very active practice as a medical man,—had borne fruit and promised much more. Out of a number of papers and separate publications the following may be specially mentioned:—

"Campanology," Inscriptions on Church Bells, &c. 1872.

"An Architectural and Historical Account of the Shrines of St. Alban and St. Amphibalus in St. Alban's Abbey." St. Alban's: Langley. 1872.

"The Altars, Monuments, and Tombs in St. Alban's Abbey, A.D. 1428. Translated from the original Latin, with Notes." St. Alban's: Langley. 1873.

"The Paintings on the Choir Ceiling of St. Alban's Abbey Church." St. Alban's: Randall. 1876. (Also, with Additions in "The Sacristy" (New Series, No. III., 1881.)

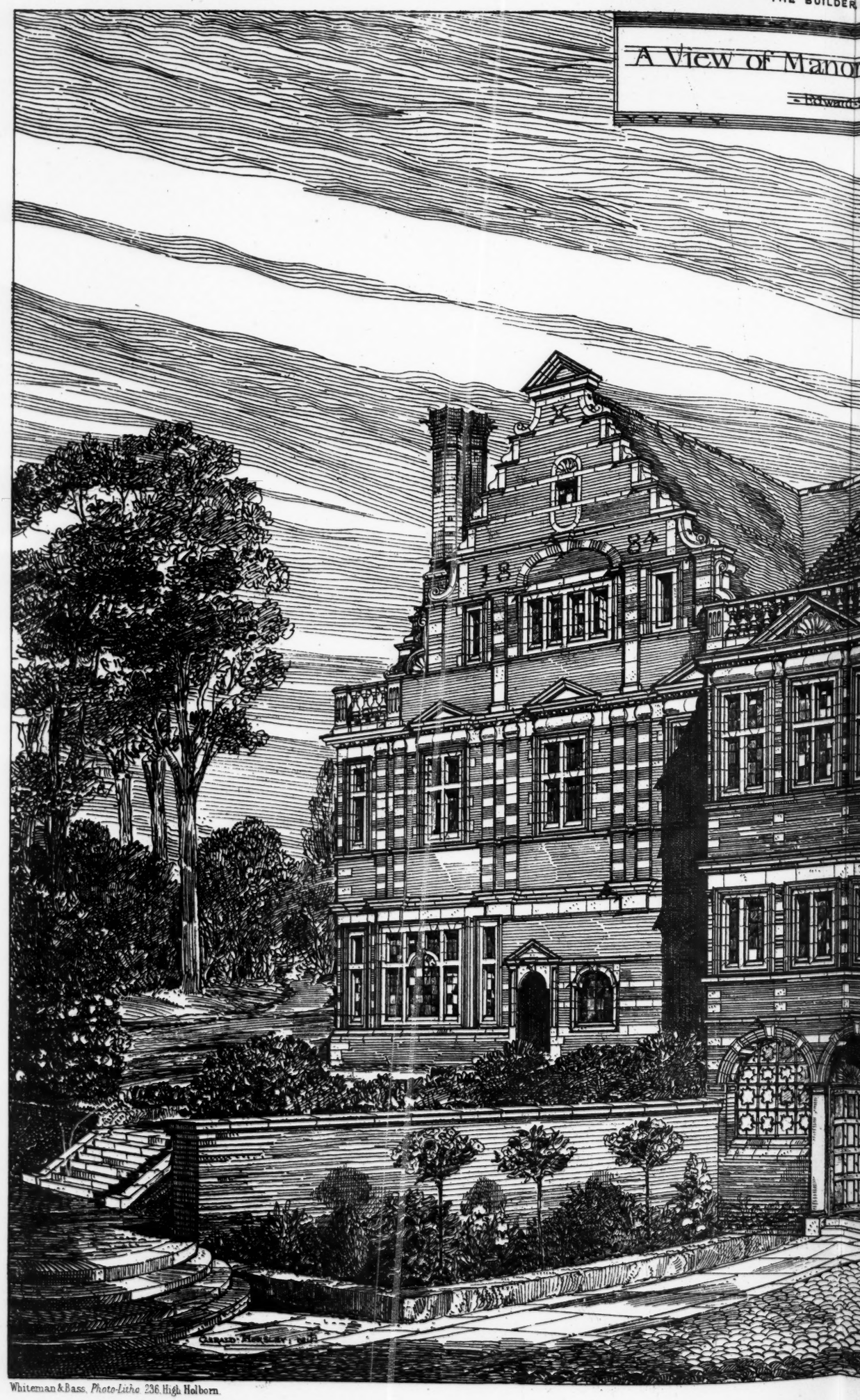
"A Mediæval Pilgrimage to the Shrine of St. Alban." ("The Antiquary," vol. ii., No. 12, December, 1880.")

"Marford Bridge." 1881.

"The Wall Paintings in St. Alban's Abbey." Read before the Bedfordshire Archæological Society. (*Archæological Journal*, 1882.)

SCREEN IN CHOIR, CHARTRES.

THE illustration of this, as will be perceived, represents the view in the apsidal aisle at the eastern termination, showing the aisle side of the screen which separates the aisle from the choir. The sculptures run all round the semi-circle, in no chronological order, however, and with an odd mingling of Biblical and imaginary subjects. In our view the two on the right hand are readily recognisable as the "Transfiguration" and the "Woman taken in Adultery." It is not very easy to say what the third one represents, but it is a curious incident in it that it includes the sculptured representation of a Classic church with a dome and peristyle and a segmental-arched head over the doorway, an incident very unusual in even Late Gothic sculpture. Another curious point about the general design is that it seems to get earlier in style as it rises, for the basement story of the screen, with its round arcading and panels with enriched moulding, seems to have fairly merged, if not into Classic, at least into the most debased Gothic; then comes a more Gothic-looking ornament over it, and the upper portion is Late Flamboyant. It is curious to see in the capital of the large pier behind the trace of the Classic capital, and then to see in the panelling of the screen the approach of the Classic element again, after all that has intervened. The scheme of the design is very effective, with the sculptures standing out against deep shadow, and the figures of modern historical bishops and saints placed, as it were, on another plane in the design, and marking its main division into bays. The contrast between the solid grandeur of the older Romanesque work and the lace-like fragility of the Late Gothic work, is as striking here as at Gloucester and elsewhere in our own cathedrals.



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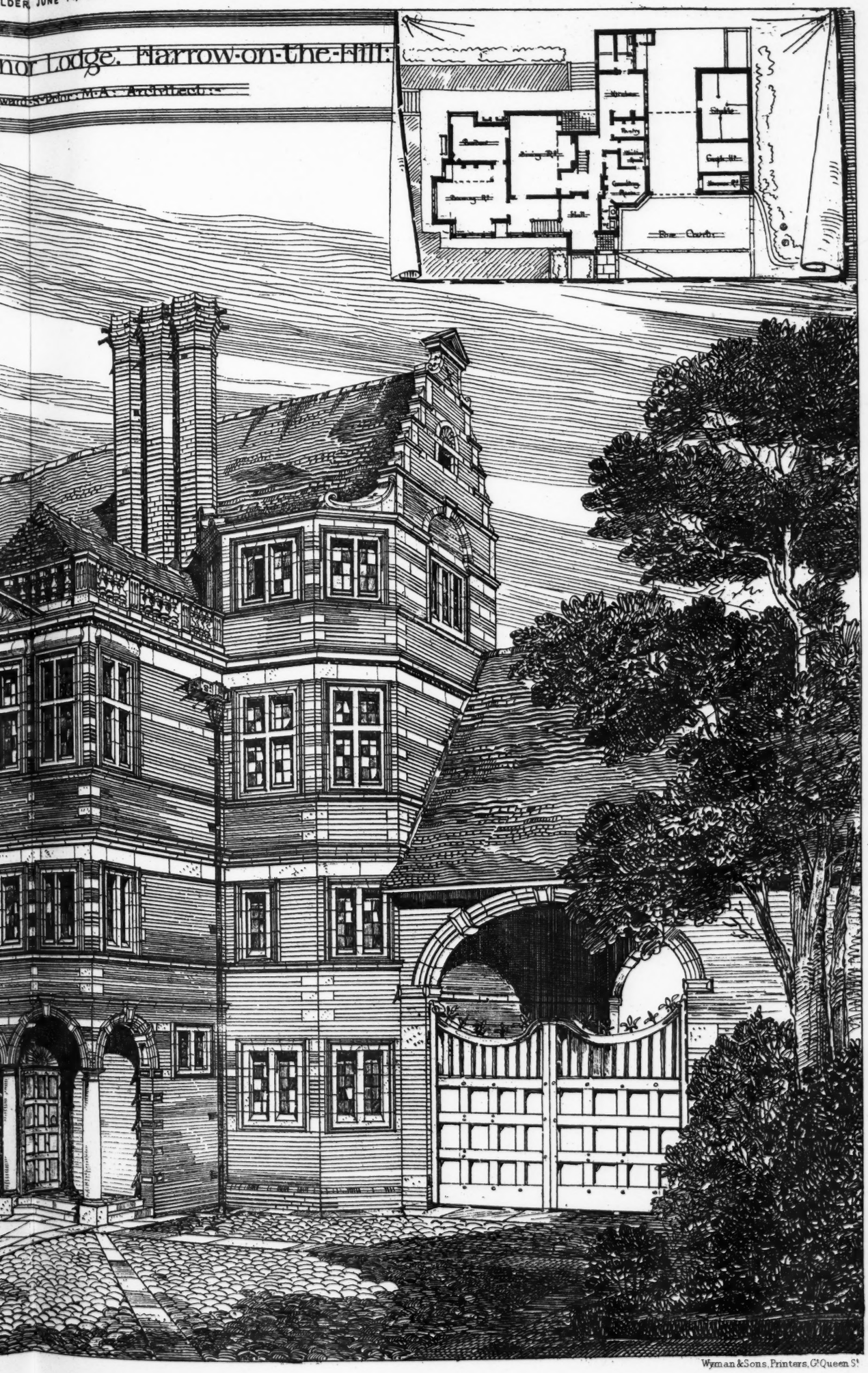
wards, Esq., M.A., Architect.



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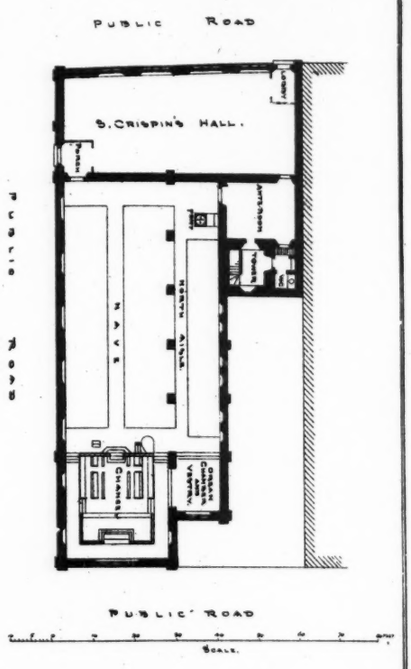

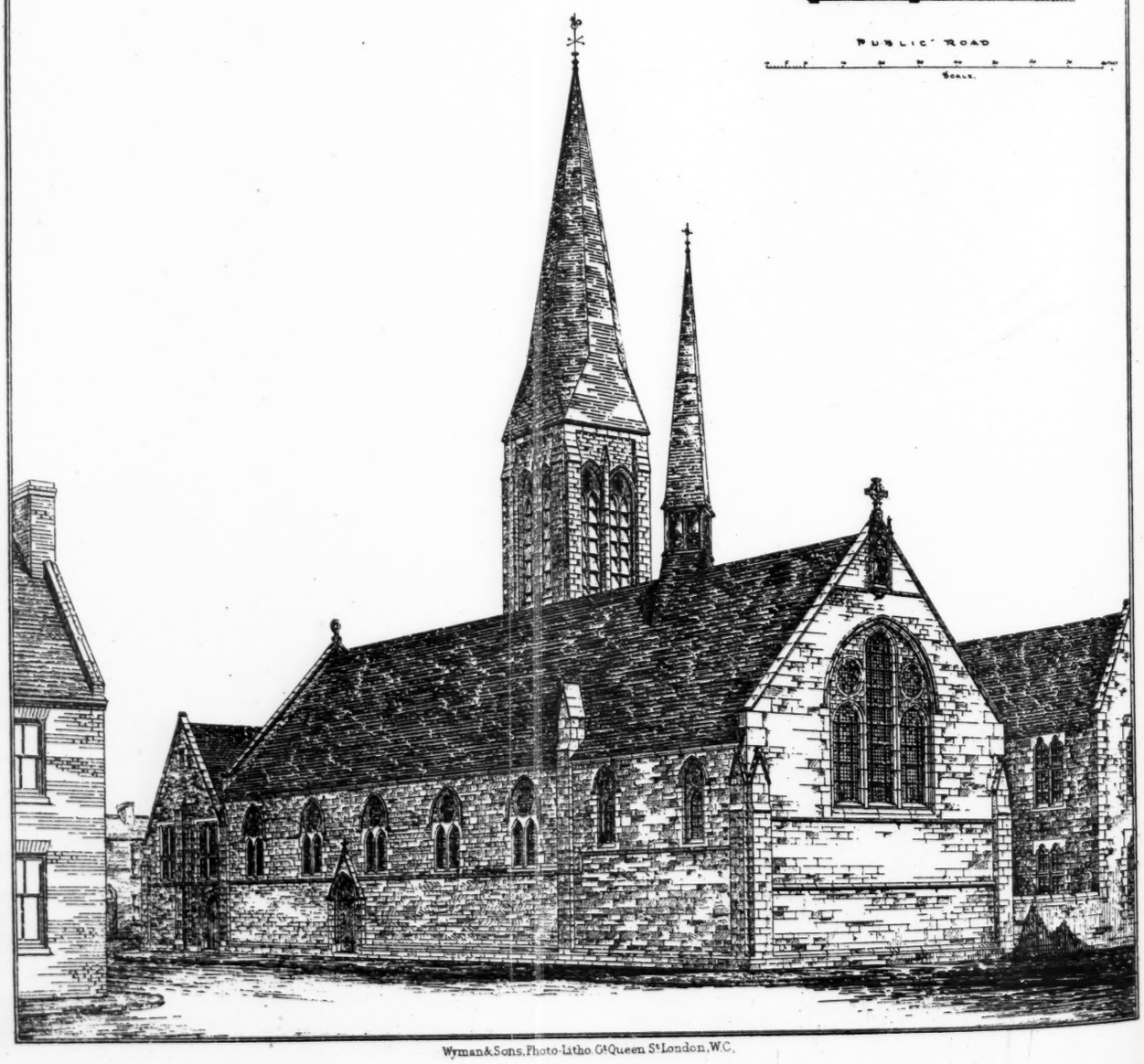

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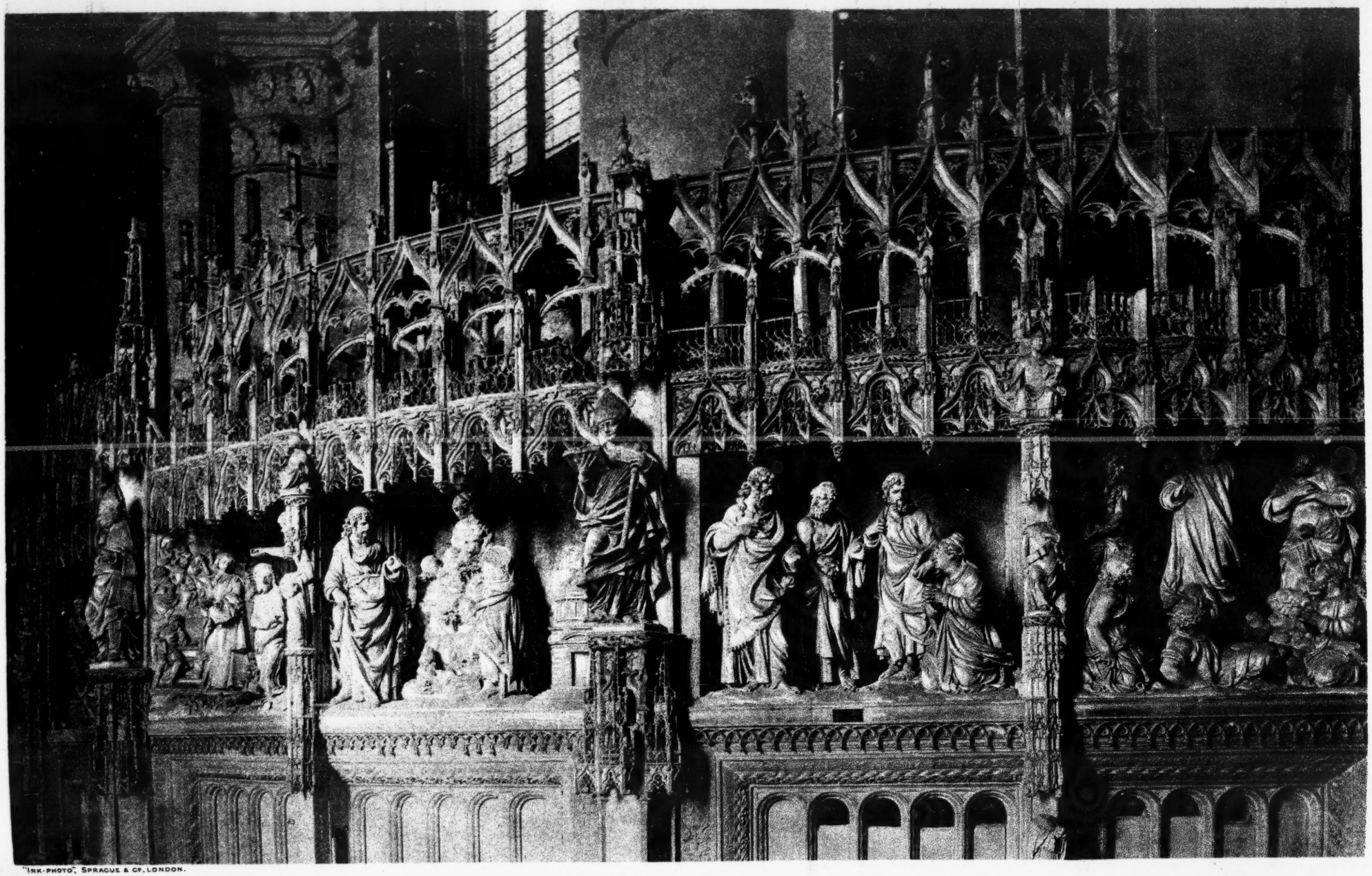

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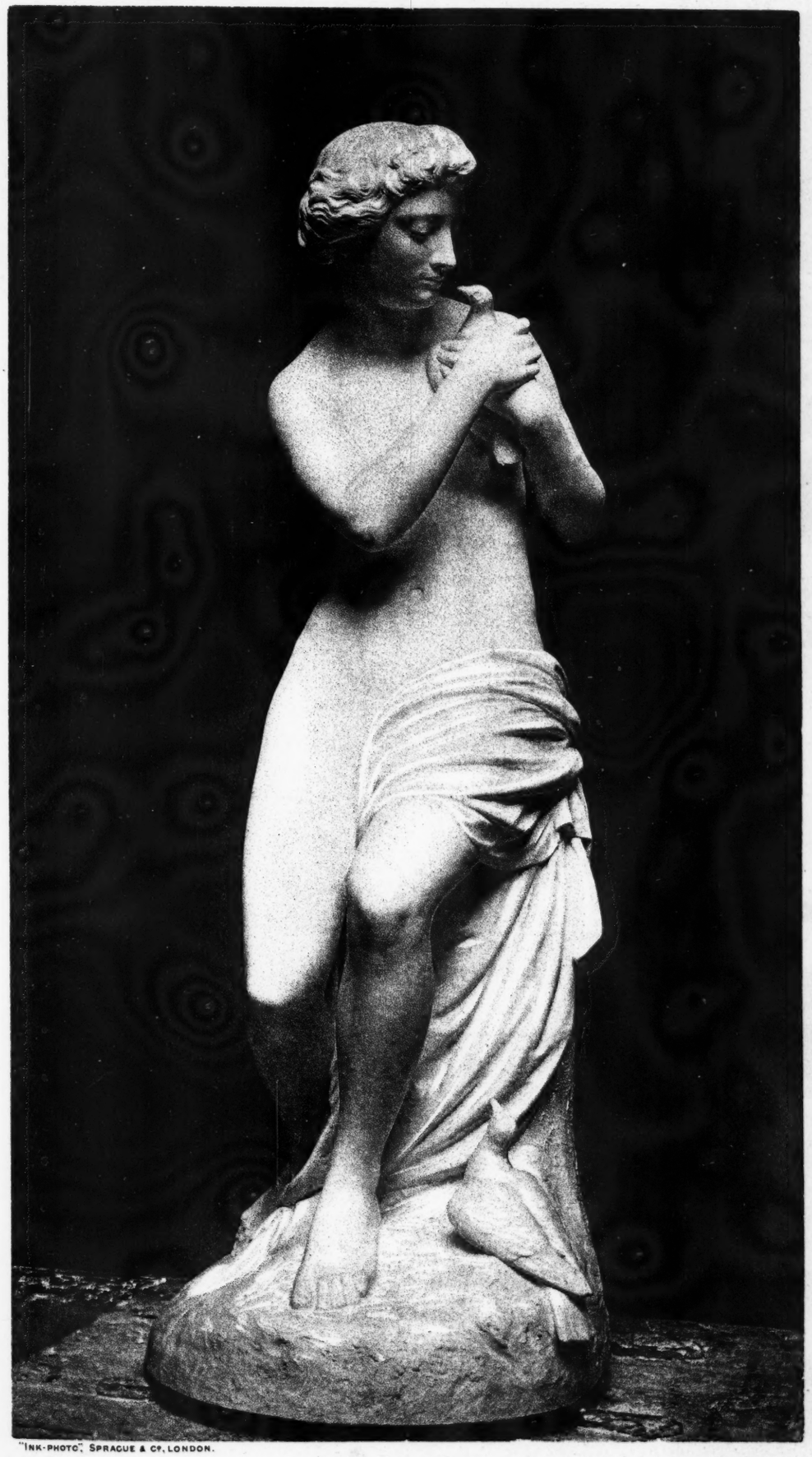
CHARTRES CATHEDRAL: SCREEN ENCIRCLING EASTERN APSE.



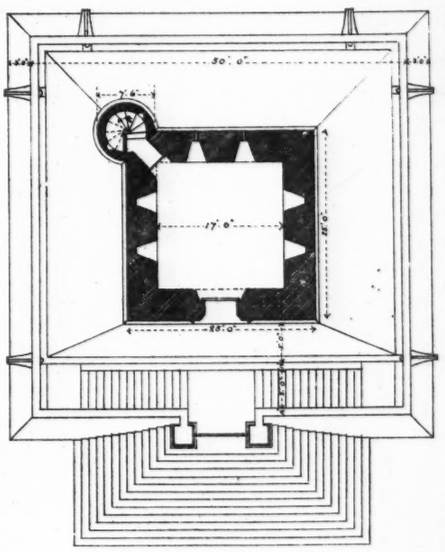
"INK-PHOTO," SPRAGUE & Cº, LONDON.

SCULPTURE AT THE ROYAL ACADEMY.

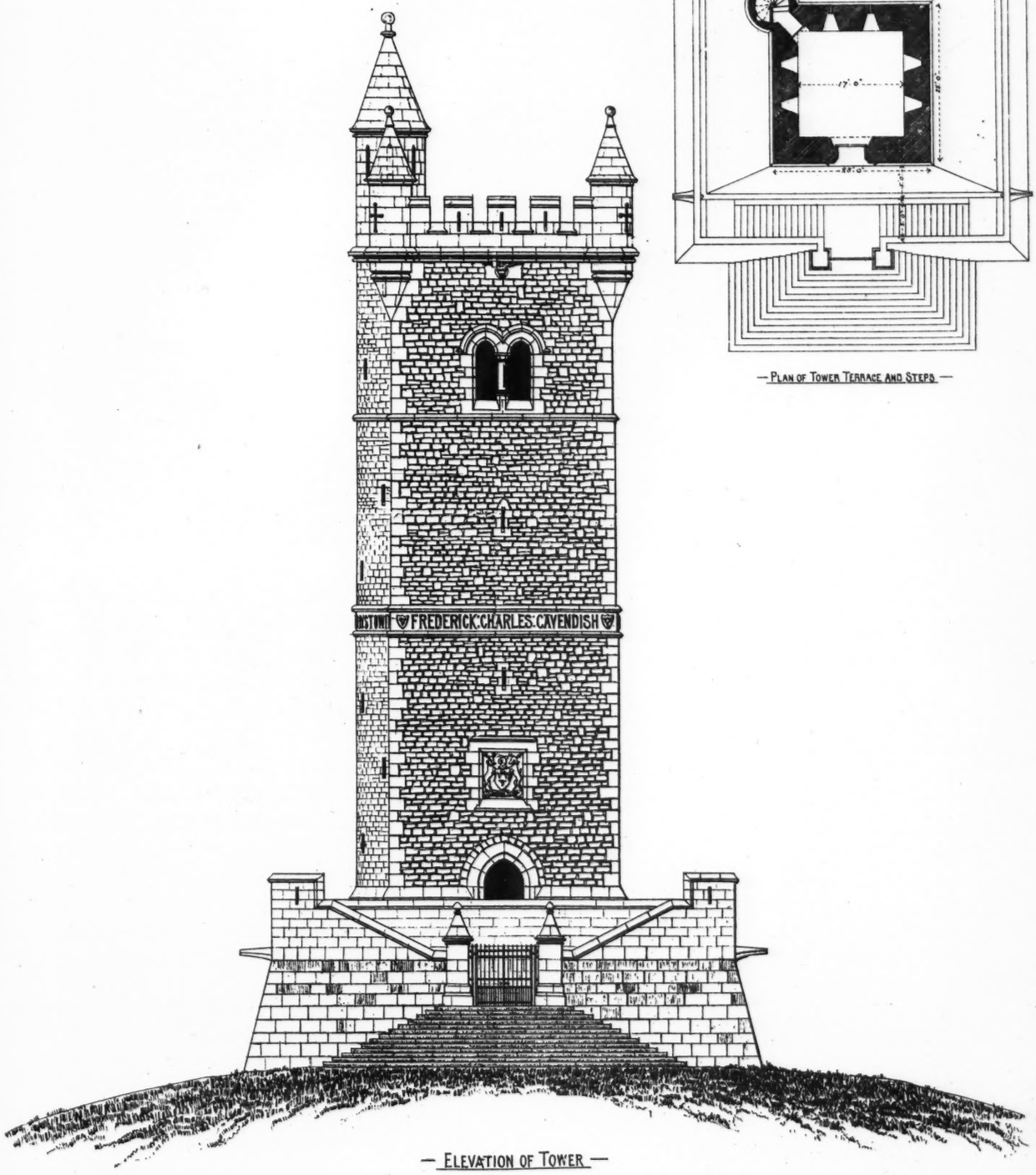
No. 4.—"YOUTH," BY MR. W. CALDER MARSHALL, R.A.

— MEMORIAL TO THE LATE LORD FREDERICK CAVENDISH —

— DESIGNED TO BE ERECTED ON THE SOUTH NAB NEAR BOLTON ABBEY —



— PLAN OF TOWER TERRACE AND STEPS —



— ELEVATION OF TOWER —

THOS: WORTHINGTON, F.R.I.B.A.
JOHN G. ELGOOD, A.R.I.B.A. ARCHTS,
110 KING ST., MANCHESTER.
OCTR 1883.

Wyman & Sons, Photo-Litho. C^t Queen S^t London, W.C.

MISSION CHURCH OF ST. CRISPIN, NORTHAMPTON.

THIS church, with the buildings attached, is situated in the parish of St. Sepulchre, Northampton, so well known as being one of the few round churches in the kingdom. The mission church which we this week illustrate is the outcome of the extended effort of the Rev. F. S. Thornton, Vicar, and a committee, composed of 300 working men, not only shoemakers but of various other trades, who have all taken a great interest in the work. The church itself consists of a nave and a chancel, measuring together 91 ft. long by 25 ft. wide, and with aisle, sacristy, and organ chamber. Across the western portion of the site is built St. Crispin's Hall, to be used for schools and various mission purposes. Connected with the hall and the aisle of the church is an ante-room, which will serve the double purpose of a retiring-room from the hall and for a choir vestry. Provision is made in the design for a tower and spire, the ground stage of which is at present erected, but this forms a means of access to the basement below the ante-room, where will be placed a Haden's heating-apparatus, that will warm the church and hall together or separately, and it also will contain coppers for boiling water for teas, &c. From the exterior door of the tower is reached a small yard, provided with a urinal and closet. The height of the side walls of the church is 18 ft. to the wall-plate and 35 ft. to the ridge. The whole of the exterior walls of the Church will be built of rich, hard brown Northamptonshire stone, and Westwood Bath stone dressings. The lower portion of the interior will be finished in fine chopped faced stone, and the upper portion plastered for decorative colouring. The roof will be covered with strawberry-coloured Broseley tiles, and the junction of the nave and chancel will be marked on the exterior by a tall flèche, and in the interior by an open wood screen. Tiles and wood blocks will be used for the interior floors. Accommodation will be provided for 350 persons, exclusive of the choir, and at the present time considerable progress has been made with the buildings, which are to be opened during the present year. The style of the church is a simple treatment of Gothic with some leanings towards Early French detail, in recognition of St. Crispin's connexion with that country. The architect is Mr. M. H. Holding, A.R.I.B.A., of 1, Market-square, Northampton, and the contractors for the whole of the work Messrs. Reynolds & Son, also of the same town.

MANOR LODGE, HARROW-ON-THE-HILL.

MANOR LODGE is situated on the top of Harrow Hill. It is being executed in brick with terra-cotta dressings, from Messrs. Doulton & Co., Lambeth.

The photo-lithograph is taken from the drawing in this year's Academy. The contractor for the brickwork is Mr. Turner, of Watford. Mr. E. S. Prior is the architect.

SCULPTURE AT THE ROYAL ACADEMY.

NO. IV.—"YOUTH."

BY MR. W. CALDER MARSHALL, R.A.

THIS is a life-size figure standing against the north wall of the "lecture-room" in the present Academy exhibition. The sculptor of "Sabrina," which we can remember for so many years back, still delights in subjects representing youthfulness of physique and feeling. The modelling of the contours is very delicate, and the position of the figure graceful and well balanced.

MEMORIAL TO THE LATE LORD FREDERICK CAVENDISH.

WE publish this week the design selected for the memorial tower to the late Lord Frederick Cavendish, which it was intended to build on the South Nab in Wharfedale, near Bolton Abbey, on the moors above Barden Tower.

It will be remembered that in the autumn of last year the committee adopted the design of Mr. Thos. Worthington, F.R.I.B.A., of Manchester.

The working drawings and specification have since been prepared by Messrs. Worthington & Elgood, and estimates obtained from several contractors, but just as it was on the point of settlement a memorial was addressed to his Grace the Duke of Devonshire, in the form of a protest from certain artists and others against any monument being erected in Wharfedale, which they imagined might interfere with the contour of the lines of the landscape.

We understand that no definite course of action has yet been determined on by the committee.

LIVERPOOL OPINIONS ON THE MANCHESTER CANAL SCHEME.

THE following is a portion of a letter from Sir W. Forwood, which appeared recently in the Liverpool *Daily Post*, and may be of interest at the present moment, as representing the view which those who have large interests in Liverpool take of the matter:—

"Our opposition is not a commercial opposition; we have no fear of the competition of the Canal, but we have the gravest apprehension of the injury which the proposed works in the estuary will cause to our bar and to the approaches to our docks. Therefore the great weight of the opponents' evidence has been directed to prove this.

Our commercial evidence has been simply to combat the estimate of the benefits which the promoters state Lancashire will derive from the construction of the Canal; and we think we abundantly proved how utterly insignificant and contemptible these would be when compared with the damage which will be done to our port by the proposed works.

Mr. Leader Williams and Mr. Abernethy, the engineers to the Ship Canal, both stated, without any qualification, that the bar was maintained by the scour of water on the ebb tide, and that the reduction of the tidal capacity of the estuary would be of serious consequence to the bar.

The estuary is like a bottle, the neck representing the Crosby Channel, terminated by the bar; the bottle, which is ten miles long by three to four miles wide, is filled by the incoming tide. Directly the tide turns, this large reservoir of water empties itself by rushing violently through the neck at a speed of five or six knots an hour, scouring away in its progress the deposits of silt and sand, and so keeping the bar clear and preventing it silting up. Without this rush of water the ebb tide would probably find its way out, meandering quietly through a number of shallow gullies which it would form in the sand-banks, and which would not be navigable except by small vessels.

It has been estimated that a spring tide comes in laden with 100,000 tons of sand held in suspension. At slack water, which takes place at the top of high water, a very large portion of this is deposited on the banks; and the upper estuary,—that is, the portion of the river above Garston,—would quickly silt up if it were not for another silent force of nature known as 'fretting.' The channel above Garston oscillates or wriggles about from one side of the estuary to the other, and in doing so it erodes and undermines its sides, which tumble in, and the sand thus loosened is swept out by the ebb tide. This wriggling motion of the channel keeps the whole of the sand in the upper estuary in a sort of perpetual motion, and prevents accretion; by this means the tidal capacity of the estuary is maintained.

Manchester proposes to form a channel through this estuary of eleven miles in length, to be constructed of training walls of stone. These walls will have two serious effects,—they will fix or stereotype the channel, its wriggling motion and fretting action will be stopped, there will be nothing to stir up the sand deposited at the top of high water, and the result will be rapid accretion, and in the end reclamation. Then the direct action of the training walls will be here, as it has been everywhere else,—on the Seine, Lune, Ribble, &c.,—accretion; the walls arrest the tide, and the sand held in suspension is deposited.

The action I have described will undoubtedly take place; Mr. Stevenson, who has done more estuary work than all the other engineers together, says so. Mr. Eads, the great engineer of the Mississippi bar and estuary, says:—'It is not a matter of opinion, but of knowledge.' The tidal capacity of the estuary will be gradually reduced, and as it is reduced our bar will shoal, and banks accumulate at our dock entrances."

We may add to this the following from a private letter of the manager of a Liverpool shipping firm, which we have permission to publish:—

"No sensible commercial man in our city is in the smallest degree moved by a fear that the construction of the canal would do any harm to Liverpool in a business sense. We know a great deal better than that. In the first place, steamers of any size would not go to the expense and risk of going up, when they might be discharging in the Liverpool Docks; and again, the effect, if it be ever made, which I still regard as doubtful, would probably be to the advantage of our port, as it would tend to a reduction or re-adjustment of port charges, by which cargo might be re-attracted here which is going to other places, such as Fleetwood, where dues and charges are lighter. I look upon the scheme as an engineering enterprise, and have no hesitation in saying that the dividend which the promoters will obtain powers to pay the shareholders on the subscribed capital during the progress of the works,—(say for five to eight years) will be the only dividend they will ever get out of it. What we object to is the risk to the estuary of the Mersey by the proposed works. We are decidedly in danger of damaging our deep-water channel by the process they contemplate. You may or may not know that there is now 4 ft. less water on the bar than seventeen years ago, so that with our steamers getting larger and deeper this is clearly no time for running any risk of checking the scour over the bar. Moreover, take Bristol as an example; the Avon is, at least, as good and navigable as any Manchester ship canal they can make, and much shorter, and yet they are extending the dock works at the mouth of the Avon to avoid having to navigate the river, and bringing goods up by train.

Once more, is it logical to compare the proposed Manchester scheme with the Suez Canal? The Suez Canal is only (let us say) halfway between here and Bombay. Goods going out or coming home from the latter place would be 90 to 100 days by sailing vessel, and some 50 or 60 at least by steamer; *viâ* the Canal they go in 25 to 30, a very vast difference. Arrived at that point of the voyage, only half the journey has been accomplished; arrived in Liverpool for Manchester, the goods are practically at home, and a decent competition will gradually reduce the forwarding on to a proper level, without expending 8,000,000*l.* in making a canal up which but few large steamers would care to go! One Manchester paper alone had the sense to look at the estuary question, and show that the damage to the Liverpool bar would be a far greater injury to Manchester than the canal could be a boon."

HEALTH EXHIBITION CONFERENCES.

THE DWELLINGS OF THE POOR.

THE second* of the series of Conferences on the above subject under the auspices of the Mansion House Council was held on Thursday, the 5th inst., at the International Health Exhibition. The Archbishop of Canterbury presided.

Mr. James Hole read a paper on "Suburban Dwellings and Cheap Railway Fares." He stated that the increase of the metropolitan population was about 50,000 annually, and that all the efforts of benevolence in the past twenty years would not provide the accommodation sufficient for one year's increase. The exigencies of space only permitted of the block system for the growth of the population. A better solution of the question was the single dwelling outside London, where the tenant could have a few yards of garden, and cultivate the home feeling such as he could not experience in buildings constructed with the aspect of a barrack or workhouse. In these the sense of comfort and beauty was ignored, and a city composed of a large aggregation of such buildings would be a mournful spectacle indeed. Mr. Hole next referred to what had been done by the Artisans', Labourers', and General Dwellings Company, and especially at Noel Park, near Hornsey, where the rentals ranged from 6s. to 11s. 6d. per week. One great benefit to the poor was that, on the estates of this company, public-houses were not permitted. What was being done by this company should be done all round London in connexion with the main lines of communication, but differing on the following points from the methods of the Artisans' Dwellings Company (Limited). To meet the growth of population, model villages should be created around the circumference of the metropolis. To do this the land should be secured before it was too late; power being given to take it at a fair valuation. Secondly, the railways should be induced to afford adequate facilities at reasonable rates. The so-called workmen's trains did not meet the necessities of the case, and were not convenient for the railway companies themselves. To save the companies trouble, the ticket might be combined with the rent. The third and most important difference was that the dwellers in these model villages should be encouraged to become the owners of their own dwellings. The Artisans' Dwellings Company had abandoned this part of their scheme, and had now become simply an investment for capital. To carry out his suggestions he proposed the creation of a paid Government Dwellings Trust, with the necessary powers to carry out working-class model towns, the funds of which should be derived in the first place from the issue of debentures; secondly, by the con-

* For a report of the first Conference see last week's *Builder*, p. 819.

tributions of the working classes in the repayment of the mortgage; and, lastly, if these were not found adequate, by a loan from the Government.

Miss Lidgett next read a paper on "The Treatment of the London Poor." The writer spoke from experience of the dreadful condition of the dwellings of the poor and of the almost hopeless task of improving them. To any one trying to grapple with this state of things a striking feature was the want of hope to all who were most immediately concerned. The landlord who had unfortunately invested in this low class of property complained that if he repaired anything it was soon ill-used and broken, while the sanitary inspector seemed to have lost all sense both of sight and smell, which he only recovered on finding an improving landlord, on whom he duly served his notices. All the way round they seemed to be entangled in a system of broken contracts. Miss Lidgett then referred to the labours of Mr. Ruskin and Miss Octavia Hill to improve the dwellings of the poor, to the efforts made to teach the people how to keep them clean, and how to pay for them honestly. This was not a mere matter of bricks and mortar, of plaster and whitewash, that could be ordered or inspected by public authority, but was a work, especially in the matter of rent-collecting, that for the most part should be done by ladies. In the future she hoped that dwellings for large numbers of people would be so constructed as to remove some of the special occasions of evil common in tenement houses, and that they would be kept at such an average standard of decency as not to require continued setting in order. When a court had once become a home of lawlessness nothing short of the efforts she had indicated would reclaim it, and nothing remained but to pull it down and scatter the inhabitants, who could not even then be received into improved dwellings. Many must fall out of the ranks, and strong hands were required to help them to their place again.

Mr. H. D. Harrod read the third paper, on "The Creation of a Building Fund." All the very excellent work of the Sanitary Aid Committees and kindred societies and workers, could at best be looked upon as a mere partial effort to meet the exigencies of the case. The question must ultimately be dealt with in a systematic and comprehensive manner. There were commercial and philanthropic sides to the problem, which it was desirable to keep apart, for though they had been successfully united by Miss Octavia Hill, he had great doubt as to their harmonious blending on a large scale. A commercial company was hampered by its desire to make a dividend, and a large Public Trust was preferable in many ways. According to Mr. Shaw Lefevre's figures, taken as a basis, land purchased by arbitration without the compensation given under the Lands Clauses Act would cost 8s. per foot or 17,424*l.* per acre. Dealing with 42 acres, of which one-half would be covered, the other half being left for roads and open spaces, the cost would be about 2,500,000*l.* The rents charged should be 2s. 6d. per room, or 4s. for two, and on this basis the income would amount to 148,512*l.* Allowing two-fifths for expenses and repairs, the net income would be 89,108*l.*, or sufficient to pay 4 per cent. on nearly the whole capital, and leaving only a small outlay to be made from the Trust Funds. If the State would lend half the amount required at 3 or 3½ per cent., there would be no difficulty. A scheme, such as he had indicated, would provide for 47,140 persons, or about double the number provided for by the Artisans' Dwellings Companies. The clearances would be effected and the buildings erected gradually, and it would be the aim of the trustees to provide evicted tenants with immediate accommodation. All the houses would undoubtedly have to be rebuilt sooner or later, and the sooner the better. He had no desire to see the Trust swamping private enterprise in the same direction, and some of the funds might be profitably employed in assisting private individuals or small companies at a moderate rate of interest.

The Archbishop of Canterbury, in opening the discussion, said that every day showed public attention was being directed to a matter to which many earnest labourers had been trying to call attention for the last forty years. He felt sure that some great good would result from the present agitation. Long ages ago the idea of a Greek or Roman city was that it should be compactly built, with very little knowledge indeed of sanitation, but with the proviso that all round about the walls there should be a great area of common land. It was too much to hope for great rings of land around the villages and towns of England, but the heirs of those to whom lands belonged might put the people in possession of things which were quite as good. The old city of Vienna at the present day had around it a great stretch of green meadow lands, beyond which the modern city had been compelled to establish itself. Something approaching that, on a gigantic scale, would be the great centre of London, circled by towns built with some idea of sanitation, and surrounded by their own common lands. It had been well suggested that great things might be done by enabling the working classes to become the owners of their houses, but they knew as a practical people that such could never completely be the case. It was not good for human beings to be in the hands of the middleman. He was not so chimerical as to wish to see the whole of the land inhabited by the poor covered by model blocks. The artisans did not like living in these large buildings, preferring rather houses or cottages which could be made habitable. The poor liked to make their own homes, and the English people, above all others, liked to show character in everything about them. All honour was due to those who in the first instance had attempted to deal with the subject.

The Rev. R. C. Billing (Vicar of Spitalfields), hoped none would be misled by the statistics published as to the accommodation provided for the poor who were displaced by so-called improvements. He would like to see a legal definition of over-crowding, and he contended that a certain amount of cubic feet of air should be allowed to every human being in the metropolis. All houses let out in tenements should be under inspection.

Rev. G. S. Reaney considered that the law, as regarded sanitation, should be much more stringent. Neither private enterprise, which had led to the present state of things, nor benevolence, was able to cope with the difficulty; what was required was Government interference.

Rev. H. Solly mentioned that the open space in the centre of Shaftesbury Park had been built over because the enterprise looked to its five per cent. rather than to philanthropy. He did not think the question would be solved by the workmen going to a great distance from their work; the work should rather follow the workmen.

Mr. A. Parker, Mr. Cooper, and others, addressed the meeting, and the Conference adjourned.

DIFFICULTIES OF SANITARY ADMINISTRATION IN THE METROPOLIS.

The Conference resumed its sitting on Friday, the 6th inst., when the chair was occupied by Cardinal Manning.

Mr. Shirley F. Murphy, M.R.C.S., Medical Officer of Health of St. Pancras, read a paper entitled "Some Difficulties of Sanitary Administration in the Metropolis." He referred to the small share that a consideration for health had in the London Government of the present day. In some parts of the metropolis people were still dying nearly at the rate at which people died in the large towns a century ago. Recognising this fact, then, was it too much to ask that thought for health should be one of their chief considerations? With regard to over-crowding, up to the present time the thought that had controlled the arrangement of houses upon a site was chiefly the convenience of the traffic rather than the health requirements of the inhabitants. It was not until 1855 that London insisted upon the preservation of any open space at the back or side of the houses, while it was not till 1862 that the height of a building was held to have any relation to the need for ventilation, and even then only to buildings about to be erected in new streets of less than 50 ft. in width. To existing streets this did not apply, and high unventilated houses were permitted on all sides. Much difficulty had arisen from an imperfect recognition of the fact that the manner of construction of the house affected the health of the inhabitants. No adequate provision was made for those who were unable to afford the means of occupying a whole house. Even where houses were specially provided for the poor, they could not always claim to meet the requirements of health, and the so-called model lodging-houses, he believed, would be condemned by a more enlightened public opinion. London had no Sanitary Authorities to deal with such questions. At present they appeared to exist rather for the removal of nuisances than for the prevention of disease. The difficulties of District Boards were often very great in dealing even with matters over which they were entitled to exercise complete control. London was already many years behind several towns in respect to house drainage, although as far back as 1855 the District Boards had full powers to insist upon the drains being made "in such direction, manner, and form, and of such materials and workmanship, and with such branches thereto, and other connected works and apparatus and water-supply as the Board should order." In practice it became almost impossible to insist upon one kind of apparatus on one side of a street, which was, perhaps, in another district. It was natural that any one authority, before modifying its procedure, should ascertain what its neighbours were doing, and it was evident that at the time it would find them taking no action in the matter. The authority therefore, finding its position would be exceptional, declined to proceed further. He left them to judge how much probability there was of the thirty-nine different authorities in the metropolis departing from the various methods of their own creation, and adopting a uniform and improved practice. The fault was not that of the local authorities, but of a system, and nothing but the alteration of that system would remedy the evil. At the present time no sanitary administration deserving the name could be said to exist in the greatest city in the world. The local sanitary authorities had no jurisdiction over many subjects of vital importance to the public health, and the authorities upon whom these duties devolved were not primarily concerned in the prevention of disease. Surely it was time that London, with her vast population, should demand a sanitary administration worthy of herself.

Mr. B. A. Whitelegge, M.D., read a paper on the same subject, in the course of which he said that in the laws bearing upon sanitation in the metropolis there were many important omissions. At the same time it was none the less incumbent upon the authorities to exercise the powers conferred upon them, many of the present evils being attributable to their neglect in doing so. There should be repeated inspection of tenement houses, and it was absurd to allot to one man a district with a population of 50,000 or 60,000 people. The sanitary authority had vested in it the responsibility of taking the initiative in active measures, but in many instances it was reluctant to do so. Much might be done by individual and collective action in the way of organising public opinion. The poor should be educated as to the importance of healthy houses and surroundings. The attention of the authorities should also be directed to all unhealthy conditions which could be found, and the evils carefully remedied. The thirty committees in connexion with the Mansion House Council had inquired into over 500 cases, the utmost secrecy being observed as to the quarters from which information was received.

SUGGESTIONS TO THE ROYAL COMMISSION.

Mr. C. M. Sawell read a third paper, entitled "Suggestions to the Royal Commission on the Dwellings of the Poor." This paper extended far beyond the time allowed, and was towards the end received with some impatience. He suggested that no immediate transformation in the condition of the poor could be expected, their character needing improvement in the first instance. The housing of the poor he considered had become a practical monopoly, and exorbitant rents were charged for the vilest accommodation. The system of leases had a tendency to accentuate the evils complained of, and he suggested that Draconic powers should be given to municipalities to acquire property without having to pay any excessive compensation. Mr. Sawell then dealt generally with several matters, such as the licensing laws, the inspection of lodging-houses, Government loans to assist reconstruction, and reduced rates on improved dwellings.

Dr. Godfrey explained a scheme with which he was connected for enabling workmen to purchase their own houses out of rent. He contended that his system would allow the labouring man to put his finger into the money ring, and to turn his industry to the best account.

Dr. A. Carpenter (St. Thomas's Hospital)

referred to the antagonism existing between local self-government and centralisation. It was a mistake to trust too much to detail in connexion with sanitary or legislative matters; and the great thing was to get the people educated to such a level that they might see what was necessary to be done. It was a mistake to expect Parliament to do everything.

Rev. Mr. Hillocks entered upon the subject of the treatment of the London poor.

Rev. George M. Murphy (London School Board) thought it would be well if the Mansion-House Committee would convene a meeting of *bonâ-fide* working men and hear what their view was on this question. In all he had heard to-day it would almost seem as if no building societies were in existence. He believed there was no hope of any practical good being done for the working people unless it were done through themselves.

Mr. Hunter, a working man, here remarked, that although the class he represented desired the help and sympathy of the well-to-do, they would not be treated as mere machines. The working classes could teach the better classes a good deal on the subject of building societies, having solved the problem for themselves.

The Rev. Septimus Buss (vicar of Shoreditch) considered that the law had full power even in its present condition, to deal efficiently with sanitary matters. The building of houses should be supervised by some new department of State, which might be made self-supporting.

Rev. G. W. McCree thought the condition of the poor would not be much improved unless the independence of the Sanitary Inspector were indicated. One vestry with which he was acquainted contained sixteen publicans and sixteen house-farmers. Such men should not be the superiors of the Sanitary Inspector, and should have no power to remove him for doing his duty.

The Chairman (Cardinal Manning) said that Dr. Goddard's scheme seemed to be somewhat similar to a scheme of Labourers' Dwellings in Leeds, which had been in operation for forty years. This scheme had created 7,000 freehold houses, now held by workmen. When he saw a large number of working men intent on becoming freeholders he cordially supported their efforts. The large blocks erected of late years had not housed the poorer of the artisan classes and unskilled labourers, while they had housed the better class of artisans and even clerks. There was only one block he knew of, and that on the other side of the river, which the poor working man could enter. He had given long attention to this question, but he confessed that the more he studied it, the more he found difficulties which checked present action. The Mansion House Council was working on excellent lines. It had been stated that Royal Commissions were too often "shelves," and he could only hope that the present one might not come under that category. The Commissioners might draw up a report which would satisfy contending interests, but legislative action was also necessary. The people must not be slack, and if public spirit were brought into play there would be found a dynamic force which would put the statutes into operation.

Rev. Mark Wilks proposed, and Mr. J. Hamer seconded, a vote of thanks to the Chairman, and the meeting terminated.

DOMESTIC SANITARY ARRANGEMENTS OF THE METROPOLITAN POOR.

The first of another series of conferences, organised by a committee appointed by the Society of Medical Officers of Health, the Sanitary Institute of Great Britain, and the Parkes Museum of Hygiene, was held on Monday afternoon in the Conference Room at the International Health Exhibition. Dr. T. Orme Dudfield, president of the first-mentioned Society, occupied the chair, and having explained the origin of the Conference and the arrangements for the week, called on

Dr. Tripe, who read a paper on "The Domestic Sanitary Arrangements of the London Poor." After some introductory remarks, Dr. Tripe said the most important of the sanitary arrangements of the poor was the water supply and water-supply apparatus. In some London parishes the supply was almost entirely derived from what was called the constant service, such as that of the East London Waterworks Company, whilst in others only a comparatively small proportion was so given. A constant was much preferable to an intermittent supply, as by a trifling alteration of the pipes water could be drawn from the main instead of from a cistern. In many poor houses there was not a cistern when the supply was constant. He strongly urged the necessity of a cistern in all cases. He found that the best way of obtaining a supply of good water was to have a length of pipe connected with the supply-pipe before it reached the cistern, with a screw-down tap placed over the sink, so that water could then be drawn from the main instead of from the cistern. This arrangement had been extensively carried out in the Hackney district amongst the poor. It was much to be regretted that the power of the vestries and district Boards of the metropolis were not sufficient to enforce a proper water supply for drinking and domestic purposes, as well as for flushing closets. Power should be given to compel owners to disassociate the drinking-water from that used for other purposes. When the water-supply was on the constant system this could be done at a trifling expense, and when it was not on the constant system, by the intervention of a flushing-box between the cistern and the closet. This was not, however, sufficient, as the cistern was often placed in or above the closet, forming part of its roof, a most objectionable arrangement, as the cistern could not be readily cleaned out, and was exposed to frost; and if there were not a water-closet service-box or flushing-cistern the water might be contaminated by effluvia from the pan, which was often very dirty. When an intermittent was changed to a constant supply the size of the ferrule in the main, which was usually very small, should be increased so as to admit of a pailful of water being obtained from the draw-off tap as quickly as could be done under the old system from the cistern. The direct connexion so often found to exist between the sink-waste and the house-drain was most injurious, as when the cover of the bell-trap was left off or broken a current of sewer-gas could, and often did, pass into the room. He scarcely knew of a greater source of discomfort than such sink-wastes. The heads of the rainwater-pipes were, especially in poor houses, often placed near windows, so that sewer-gas could make its way into bed and living rooms without being suspected. Diphtheria, often fatal, occurred apparently from this cause, and he had met with typhoid fever in rooms so situated. He was in the habit of having rainwater-pipes so placed cut off from the drains and made to discharge the rainwater over or into a yard-gully. The drains of the houses occupied by the poor, especially when the houses were old, were very often structurally defective, being often made of bricks with open joints, from which sewer-gas and rats could escape. A very objectionable, but also a very common, plan was for several houses to be drained through an outlet common to many houses, to save carrying the drain under houses. With regard to brick drains under or near houses, he held a strong opinion as to the necessity of pipe-drains being substituted for them. Dust-bins were very often —indeed usually,—a source of discomfort and he believed sometimes of disease. The best kind of dust-bin with which he was acquainted was made of iron one-twelfth of an inch thick, well riveted together, with strong hinges to the lid, and without a bottom, so that the bin could be lifted off and the dust, &c., be easily removed. These bins, which would hold about a fortnight's dust, &c., for a small house, were by no means costly, and they were not easily destroyed or injured. The arrangements for the removal of dust and house refuse were generally deficient.

THE IMPROVEMENT OF THE SANITARY ARRANGEMENTS OF METROPOLITAN HOUSES.

Mr. Ernest Turner, F.R.I.B.A., in commencing his paper on this subject, said he was afraid that in dealing with the matter of house-room for the poor they did not always formulate with sufficient accuracy their notions of the class for whom they were catering. Hence the work which had been so far done in that direction, excellent as it was, had not really had much practical bearing on that particular problem. The artisan had had his accommodation immensely improved, but the artisan was not, unless by aid of the gin-bottle he took pains to make himself so, what could properly be called poor. The real problem before them was the sanitary housing, not of the artisan, but of the labourer. The labourer and his family had to live in one room, and it was no use endeavouring to persuade either him or themselves that he could or would occupy more. From 3s. 6d. to 4s. a week was all he could pay, and more than he could afford, and for that amount not more than one room was to be had. Certainly what were known as common lodging-houses were in these days of systematic inspection by far the most sanitary of any dwellings of the poor. It might be a question, too, how far the serious prejudice which undoubtedly existed in the minds of the poor against the huge new blocks of model buildings might not, sooner or later, wear out, as the kindred prejudice against what were known as "flats" had already pretty nearly worn out among the wealthy classes. But, be that as it might, there could be no question as to the pure and unadulterated idiocy of the plan upon which the British labourers' lath-and-plaster castle was at present arranged. It never seemed to occur to any one who built a street of houses to construct them on any other plan than such as he would adopt were each house to be occupied by a single family, although he knew perfectly well that every house would be occupied and was intended by himself to be occupied, by nearly as many different families as it contained rooms. At least, one would think, these tenements might be built double-fronted, so that one passage might serve for two. In a street of houses there would in this manner be effected a trifling saving of, say 200 ft. of frontage. That was to say, a space sufficient to build about a dozen houses more, or rather not to build them, for no more bricks, mortar, or labour would be required than at present. He would perhaps be told that this would be no advantage to the labourer-tenant, but only to the landlord. But this would be a mistaken view. The great difficulty for the poor man was cost; the great factor in cost was shortness of space. The man who could make five houses where there were only four previously, conferred as great a boon on the houseless as was conferred on the hungry by him who worked a similar increase with ears of corn. Another excellent economy was that of putting the wash-house on the top, which both saved space and conduced to dryness, ventilation, and other sanitary *desiderata*. Mr. Turner then drew attention to a set of plans of what he described as a really admirable block of buildings, recently erected at Westminster by a most uncharacteristic member of a class too generally known as the common enemy of mankind, the "speculative builder." These blocks were admirably planned, substantially built, and thoroughly "sanitated" throughout. The partitions were solid, the skirtings of cement, the floors and staircases fire-proof, the waste-pipes disconnected from the drains, the soil-pipe outside the building and thoroughly ventilated, the drains properly laid, with access and disconnecting chambers; and they were paying more than 7 per cent. Now of all the odd things that they would think of applying for the purpose of developing fire-proof qualities, perhaps the oddest would seem to be sulphur. But it was a chemical, scientific, and practical fact that Portland cement, when mixed with a certain proportion of sulphur, would stand both fire and water to any reasonable extent without turning a hair. Another excellent plan for obviating the danger of fire arising from the use of laths, was that patented by Mr. Hitchins, and which consisted of plaster screwed up in slabs and faced with a setting-coat. The whole front of the pair of sanitary and insanitary houses shown at the present exhibition, was constructed in this way. Having enumerated a long list of defects to be found in any house not built within the last twenty years, Mr. Turner said, it was a delusion to suppose that if once they began to meddle with an old house they would end in bringing it about their ears altogether. An old house was often better built than a new one. One thing, at all events, they could always do; they could always "disconnect" the drains, and in doing it they would cut off the chief danger to health at the cost of a very few pounds. All waste-pipes should be arranged to discharge in the open air. The old-fashioned and poisonous fittings could be exchanged for modern appliances; soil-pipes could be ventilated by carrying them up to the roof; and cisterns removed to an accessible position, properly covered, systematically cleaned, and cut off from communication with drains, and so-forth. Even the æsthetic side of the question need not be altogether neglected.

Mr. Rogers Field agreed with Dr. Tripe that

the cistern should always be placed where it was accessible to the householder; that should be insisted upon by the tenant. As regarded flushing, he suggested that there should be an arrangement by which the operation could be performed at one touch. He went further than Mr. Turner, for he believed that the numerous defects he had mentioned might be found in houses built ten years ago. In London, building was going on at the rate of twenty houses per day, and the question was whether they were being built with those defects. In the thirty-nine sanitary districts into which London was divided there were no proper sanitary arrangements, or if they existed they were not enforced. Stringent by-laws like those which were carried out by Local Boards in the country were required.

Professor Corfield expressed his perfect concurrence in the views set forth in the two papers which had been read. As regarded the dust question, it was the duty of the sanitary authorities to remove the dust and refuse from the bins, and that was the only way in which it could be effectually collected.

Dr. Carpenter observed that continuous and regular inspection was required in order to see that proper sanitary arrangements were carried out. The dust should be removed by the local authority. He suggested that it would be far cheaper and better for the public health if the 500,000 fires used in London for cooking purposes were got rid of, and gas substituted. He would advise all those interested in this work to pay a visit to the Parkes Museum.

Dr. Bartlett said he found a difficulty in getting rid of the dust at his house near Grosvenor-square, so that they would understand the position of the poor. As regarded their dwellings, the poor required lodging in commodious houses at rents they could pay, from 2s. to 2s. 6d. per week.

Mr. Robins remarked that the two men who passed examinations on sanitary requirements most successfully came from Mr. Waterhouse's offices. What was required was for medical men of high standing to state the principles, and the architects would then take care that the buildings were erected with a due regard to sanitary conditions.

Captain Douglas Galton was of opinion that the difficulty of getting dust and refuse removed, and of the circulation of pure air, was the cause of much of the disease in the densely-populated portion of London. There was nothing so necessary to insure sanitary progress as the education of the people in sanitary matters.

Dr. Bernays remarked that the impurity of the water was to be attributed to the bad condition of the cisterns. They ought to be thankful they had such a good water supply in London.

Mr. John Slater observed that it was utterly impossible to carry out the best system of drainage in London; but they must do the best possible under the circumstances. It was necessary in many cases to carry the drain-pipes under the houses, but these pipes could be made innocuous.

After some remarks from Mr. T. Manson, Dr. Morgan, Mr. T. Blashall, and Mr. Liggins,

The Chairman briefly summed up the discussion, observing that there were latent sanitary powers existing which should be brought into play by the authorities.

The proceedings terminated with a vote of thanks to the Chairman.

A report of Tuesday's Conference will be found in our Supplement.

ASSOCIATION OF PUBLIC SANITARY INSPECTORS.

ANNUAL DINNER.

THE first annual dinner of this Association was held in the Venetian Saloon of the Holborn Restaurant on Saturday evening last, Mr. Edwin Chadwick, C.B., President of the Association, in the chair, supported by a large number of the members and friends of the Association.

The Chairman, in proposing the health of "The Queen," referred to the example set by her Majesty to the rest of her subjects in regard to matters which the Association had at heart. One of the first things her Majesty did, as soon as the affairs of state permitted, was to direct a close sanitary inspection of all the cottages on her own estate at Osborne, and that any action which might be shown to be necessary should be taken. As a result it was found that there was a sickness and death-rate by one-third less than the death-rate prevalent elsewhere. From that result he was able to declare that if her Majesty's example were generally followed it would be for her subjects of the wage-classes as if there were a jubilee,—no sickness and no deaths,—every third year,

In proposing the next toast, "His Royal Highness the Prince of Wales and the rest of the Royal Family," the Chairman noted with regret how largely the Royal Family had suffered by diseases which sanitarians knew to be preventible. In his interest in sanitation H.R.H. the Prince of Wales was a true son of his great father, the illustrious Prince Consort, whose prominent and sole contribution for the attention of nations at the first International Exhibition was a model cottage, of accepted principles of construction, some of which, particularly as regarded damp-proof and washable walls, had yet to be realised in practice. At Sandringham the Prince of Wales had set the distinguished example of renewing all the cottages on his estate, and had taken care to see that all the cottagers were provided with an ample supply of pure, soft water. The Prince of Wales had also been the foremost to support the Commission of Inquiry into the condition of the houses of the poor, the result of whose labours would, it was to be hoped, take effect in practical sanitary measures.

In proposing "The Army, Navy, and Volunteers," the Chairman took occasion to note what sanitation had done for the army, and how much more might yet be done for it by the same beneficent agency. Heretofore, whilst the losses by the sword had been as 1, the losses by disease,—for the most part preventible,—had been as 3. By the work of the Army Sanitary Commission the death-rate of the home army had been reduced from 18 to 8 per thousand, and, by that diminution upwards of 4,000 beds in army hospitals, which would have been necessary under the old conditions of service, had been saved. The fact was that the Herbert Hospital, which was constructed on the scale of the old death and sickness rate, had been half-emptied. On the loss of our first army in the Crimea, owing to the break-down of the curative service and to the entire absence there of a specially organised sanitary service, he (the Chairman), by the help of Lord Shaftesbury, induced Lord Palmerston to send out a special Sanitary Commission, who took out with them, as one of their staff, a sanitary inspector who had done much good work in Liverpool, and who took with him competent assistants. The result of the sanitary service of that Commission was that our second Crimean army was declared by the Minister of War to have been brought back in a better state of health than it had ever enjoyed at home. By the writing of papers and by personal representations he (the Chairman) had succeeded in getting some (though only rudimentary) provision made for the application of the sanitary experiences in the Crimea to the protection of the army in India. The old death-rate there was 67 in 1,000, but this had been very materially reduced, so that during the last decade there had been a saving of 40,000 of force in sickness and deaths, and more than five millions in money. But, as they knew, the saving in force and money might be largely augmented at home and in India, and grounds might be shown for Parliamentary action for the maintenance as well as the advancement of sanitary science, with a reflex effect for the protection of the civil as well as the military population. Germany,—probably at the instance of the Crown Prince and Princess,—had been in advance of our administration in availing itself of the experience of sanitary science gained in the Crimea, for whilst our administration lagged at eight in a thousand, Germany had reduced its army death-rate to three in a thousand, as against France,—still more laggard in sanitation,—which had a death-rate of 10 in a thousand. Germany, with its army of 1,800,000 men saved, by its attention to sanitation, some 18,000 deaths every year. If we took the Germam army at 1,000,000 in time of peace, this attention to sanitation saved, beyond our laggard rate of 8 per thousand, 14,000 beds, or the contents of about twenty-two Herbert Hospitals. Or, against the higher French death-rate of 10 in a thousand, it saved about 24,000 beds, about equivalent to the provision of twenty-six hospitals of the size of Netley. He dwelt on these examples of the application of sanitary principles to the augmentation of military force and economy, as they might serve to indicate the possible future of their application under good administration to the civil community. As to the Royal Navy, it, with its death-rate of 4½ in a thousand from sickness, was in advance of the Army, but it had more yet to do. Dr. Johnson characterised a ship as a prison, with the addition of the danger of being drowned. He (the chairman) saw no reason why the death-rate of the Royal Navy should not be brought up to the death-rate of a prison, viz., to 3 in 1,000. In view of these actualities and possibilities, it was not pleasant to contemplate the death-rate of the commercial marine,—18 in 1,000,—and a double death-rate from disease, including scurvy, for want of proper sanitary inspection. In conclusion, he begged to couple with the toast the name of Captain Douglas Galton, whose services in the cause of army and general hygiene were well known.

Captain Douglas Galton, in responding, said that one reason why all Englishmen were so appreciative of the services of the Army and Navy, was that they knew that during war those forces were engaged in a perpetual struggle against difficulties. And that was the reason why we appreciated the deeds performed by that ante-type of General Gordon, the Chevalier Bayard. But there were other chivalrous struggles, besides those of armed warfare, going on daily. There were struggles against disease, struggles against mortality, which were being carried on by an army of sanitary inspectors,—men who had the welfare of the country at heart as much as the soldiers, and who certainly did quite as much for the good of the country.

Dr. B. W. Richardson, F.R.S., in an eloquent speech, proposed "The Association," the formation of which was, he said, the natural outcome of a felt want,—an absolute necessity,—and all old sanitarians welcomed its advent and had great hopes for its future. The Association was likely to become a great national institution, if the members were true to themselves, and to the duties they were called upon to perform. Their work necessitated some knowledge of a wide range of scientific principles. To do it well they must be, to some extent, chemists, mechanics, physiologists, and statisticians. If they as a body performed their work well their services would be welcomed by the medical profession, without any feeling of jealousy. The Association was to be congratulated in having the wisdom to ask their chairman of that evening to become their President, and they were still more to be congratulated on their good fortune in having obtained his services, for Mr. Chadwick was undoubtedly the greatest sanitarian of this or any other time. Although he was now eighty-four years of age, there he was presiding over them and encouraging them in their good work of conserving the health of the people. In eloquent terms Dr. Richardson briefly passed in review the principal services which Mr. Chadwick had rendered to the community, more especially in connexion with the cause of sanitation, during an active career extending over nearly sixty years. His Report upon the Condition of the Labouring Classes formed a standard volume, without studying which no one could claim to properly understand the subject. Though his name and the services he had rendered could never be forgotten, his services had certainly not received the recognition they merited in high quarters. Surely when honours were plentifully poured out on those whose services had involved the destruction of life, they were entitled to expect that the services of those who were the conservers of life should be, at least occasionally, considered and rewarded by due recognition. In conclusion, Dr. Richardson coupled with the toast the name of the President. The toast was enthusiastically received.

Mr. Chadwick, in reply, thanked Dr. Richardson for his appreciative words, and the assembly for the way in which they had received the toast. He said he quoted with satisfaction the declaration made a short time since (after years of delay and obscuration) by the leading journal,—which especially studied and followed public opinion,—viz., that "Sanitary science is the glory of modern times. It is the favourite pursuit of the present day. None is felt to be more needed and is more neglected for all practical purposes. Former generations perished in venial ignorance of all sanitary laws." Now, to retrieve that neglect one of the first steps to be taken was to show the cost of preventible

disease, and the economy resulting from the adoption of sanitary measures. Taking the case of the metropolis, he confidently estimated from what had been done by sanitation in other urban districts, and from what had been done by the same agency in some parts of London itself,—that by the adoption of proper means a reduction might be made in the present death-rate to the extent of five in the thousand. That would effect a saving, for the four millions of the inner ring of the population, of about 20,000 lives annually, and a saving of money (now spent in funerals and lost by inability to work through sickness) of 700,000*l.* per annum. This sum capitalised at thirty years' purchase would give 21,000,000*l.*, or 50*l.* per house,—enough, under a competent administration, to pay for the execution of the chief primary works required for the prevention of disease. All over the kingdom, the losses from preventible disease under the heads stated were not less than 25,000,000*l.* per annum, or three times the amount of the poor-rates. During the last decade, as the Registrar-General had shown, there had been an important reduction of the death-rate, and a saving of nearly 400,000 lives, which must have been attended by a saving of upwards of four millions of money in England and Wales, and that saving must have been in great part due to the services of the 1,700 inspectors. Of the great body of those inspectors, he was able to state that they were desirous of securities being taken for the maintenance of the efficiency and respectability of the service. It was due to them that they should all be placed in the position now accorded to the majority of the officers under the Local Government Board,—viz., that their continuance in office should be permanent during good behaviour, and that they should not be subject to removal at the hands of those members of local authorities whose private interests as property-owners were likely to be affected by the conscientious work of a competent sanitary inspector.

Mr. William Rains, vice-chairman of the Council, proposed "The Visitors," coupled with the names of Sir Richard Owen, K.C.B., and Dr. Alfred Carpenter.

Sir Richard Owen, in the course of an interesting speech, gave some personal reminiscences of his work as a sanitarian forty years ago,—work to which he said he was introduced by their president,—more particularly in connexion with the town of Lancaster. As one result of the work in which he and other gentlemen had interested themselves at that time, Lancaster had received a good supply of soft water, supplied by gravitation, in lieu of the hard water previously obtained by pumping, and the health of the town had been improved. The engineer for those works was a gentleman well known as a sanitarian, viz., Sir Robert Rawlinson.

Dr. Carpenter expressed his high appreciation of the work of the sanitary inspectors, and dwelt on some of the ways in which their work was hindered by members of local authorities. The earnest discharge of their duties must be its own reward, for they would receive little thanks from those for whom they laboured. That this was so was plain from the fact that their president was still *Mr.* Chadwick.

Lord Fortescue, who was also called upon to respond for the visitors, referred to Mr. Chadwick's labours in the cause of sanitary reform, remarking that anything which he (the speaker) might have been able to do in connexion with sanitary legislation was due to the advice and help of Mr. Chadwick.

Mr. E. C. Robins, in a few well-chosen words, proposed "The Executive," on whose behalf Mr. George B. Jerram, chairman of the Council, and Mr. S. C. Legg, hon. sec., replied, Mr. Jerram stating that although the Association had been in existence for barely a twelvemonth, it already numbered 230 members, composed of metropolitan inspectors and urban and rural inspectors in all parts of the country.

Mr. Jerram proposed "The Press," thanking it for the services which it had rendered to the Association, and coupling with the toast the name of the representative of the *Builder*, who in responding incidentally referred, amidst much applause, to the services which had been rendered to the cause of sanitary progress for a period of nearly forty years by the late editor of this journal, Mr. George Godwin, now one of the Royal Commission on the Housing of the Poor.

The only remaining toast was "The Ladies," proposed in felicitous terms by Dr. Richardson.

THE ENLARGEMENT OF THE EXCHANGE AT HAMBURG.

THIS work is now approaching completion, and according to the local press, the new part of the building will be opened for public use as soon as the dividing walls are broken through which separate it from the older portion of the edifice. The enlargement was decided upon by the municipality on April 20th, 1881, after the Commission entrusted with the examination of the plans had selected those of Messrs. Hanssen & Meerwein, making a few alterations as to the width of the Exchange Room. After the Senate had confirmed these decisions, the execution of the work was placed in the hands of the above-mentioned architects.

The foundation was commenced on the 9th of July, and was completed by the end of the year, consisting of a concrete layer about 6 ft. 6 in. in depth. The excavations were difficult to carry out, and special interest attached to them from the fact that various portions of the old walls of Hamburg were brought to light during the progress of the work. During the year 1882 the building operations progressed to the stage of the ground-floor, being completed before frost set in. More progress would have been made, but that the sandstone was not delivered as rapidly as should have been the case. In the course of 1883 the exterior and a great part of the interior were finished.

The façades are similar to those of the old exchange, being in the Italian Renaissance style, and designed on the model of the Sansovino library at Venice. The material used was Oberkirchen sandstone, known for its weather-resisting properties; the quantity employed being about 50,000 cubic feet. The portals are ornamented with figures typical of industry, agriculture, mining, postal and telegraphic communication, &c., these sculptures having been entrusted to Herr E. Pfeiffer, of Hamburg.

On the ground-floor are the Exchange Room of about 12,000 square feet in size, the telegraph-office, thirteen offices, lavatory, &c. It had originally been intended to have offices on the first floor, but this portion of the new building will now be occupied by the Chamber of Commerce. It is also in contemplation to devote a certain amount of space to an exhibition by local artists. In the basement there is, amongst other offices, a large restaurant. It is also projected to carry out some improvements in the exterior of the older portion of the building.

GERMAN SANDSTONE.

THE *Cologne Gazette* calls attention to the increased development of the sandstone industry in the Eifel district, more particularly in the Kyllthal, between Cologne and Treves. The Kyllthal sandstone would seem to have gained a wide-spread reputation for grinding purposes, and in the Westphalian centres of the cutlery industry no other description is used. Belgium is almost exclusively supplied from this source, and quantities of a certain importance are sent to France, Switzerland, and Austria. There are about 1,000 persons occupied in the quarries of Kyllburg, Denborn, Neidenbach, and Philippsheim.

Since the opening of the railway from Cologne to Treves in 1871 the red sandstone of the Eifel district has been extensively used for building purposes; its employment in that manner by the Rhenish Railway Company having done much to facilitate its general adoption. In addition to other advantages, it is not affected by the weather, and preserves its beautiful red colour for many centuries. Thus the Foundation Church at Kyllburg is built of this material, and although the edifice dates from the commencement of the twelfth century, there is not a single stone affected, and the edges of the stone-work of the spire are as sharp as when newly erected.

The sandstone for the eight armorial bears at the Berlin Rathhaus was delivered from Kyllburg in sixteen blocks, each of seven tons weight.

It is stated that one rock has now been laid free which is of more than 175,000 cubic feet in capacity.

ARTISTIC PROGRESS IN SWITZERLAND.

A MEETING of the Swiss Art Society was lately held at Zofingen, with the special purpose of discussing the establishment of an art gallery and college of art. After a careful examination the proposal was agreed to and the following general ideas were adopted for submission to the Federal Council in order to guide that body in the organisation of the scheme.

1. The Federal Art Exhibition should take place every three years. The annual contributions of the Federal Council in the intervening years (at least 4,000*l.*) should be applied to the artistic decoration of public buildings, the erection of national monuments, and the support of the exhibitions organised by the Swiss Art Society.

2. The exhibitions of the Swiss Art Society should be held in the same manner as hitherto, and an annual contribution of 600*l.* should be contributed by the Federal Council.

3. The Federal Exhibition or *Salon* should be held alternately in those cities which possess suitable accommodation and the necessary attendants, &c.

4. The choice of one-third of the members of the College of Art should be left to the Swiss Art Society.

"THE MYSTERIES OF COLOUR."

SIR,—Mr. Storey will not regret that my criticism afforded him an opportunity of adding an explanation which was necessary to the proper understanding of his views on the subject of the "primary" colours as considered from their artistic rather than the scientific aspect. I am unable, however, to accept his explanation as satisfactory. Pigments possess many properties besides those of colour, and which are not dependent on colour, and when mixed together they do not produce the uniform results which Mr. Storey's theory claims for them. Thus some blues and yellows produce pure greens, while others, quite as intense and beautiful, produce only olives or greys; and the same holds good of purples, resulting from the mixture of reds and blues. It is an error, therefore, to speak of yellow and blue (as mere colours) as producing green when we only mean that two substances, say a salt of lead (chrome yellow), and a salt of cobalt (ultramarine), when mixed together give off a green colour. The scientific explanation of this phenomenon is that the salt of lead absorbs the red and yellow rays, and the salt of cobalt the blue and violet rays of the spectrum, and thus the green rays are liberated and become visible. If the pigments were so intimately mixed as to produce a colour from the mere combination of their tints, the result would be grey (white), because, being complementary colours, they would neutralise each other, just as two rays of coloured light do. The media in which pigments are mixed, and many other conditions besides their varying powers of absorbing the colours of the spectrum, complicate the result, but all these conditions admit of scientific explanation on the Young theory of colours, and on no other. There is no subject of everyday knowledge on which such gross ignorance exists as on that of colours, and a "school of colour" devoted to the study of the science,—not the art,—of chromatics, and its bearing on the decorative arts in their hundred and one different forms, would be of a more useful and practical character, and more likely to receive support and encouragement from patrons and students than one of a technical kind suggested by Mr. Storey.

C. ROBERTS.

London Streets.—In the paper on "Wood Pavement in the Metropolis," by Mr. George H. Stayton, C.E., to which we referred last week, it is stated that the aggregate length of the streets of London is 1,966 miles, of which, excluding 248 miles in course of formation, 1,718 miles were thus maintained by various authorities, namely:—

	Miles.
Macadam	573
Granite	280
Wood	53
Asphalte	13¼
Flints or Gravel	798¾

The existing area of wood pavement is 980,533 square yards, and its estimated cost 600,000*l.* Not more than 4·38 per cent. was east of the city or south of the Thames.

THE NEW ADMIRALTY AND WAR OFFICES.

THE HORSE GUARDS STOP THE WAY.

SIR,—There has been some discussion in the *Builder* upon the subject of the designs for the new War Office and Admiralty. There is, however, something to be said upon the subject of the site, by the selection of which it would seem that a large sum of money is proposed to be spent in the purchase of property which *is not required* (at least at present) for the purpose, and which property now lets, or is worth a large annual sum. It is situate in Spring-gardens and Spring-gardens-terrace, and mews in the rear of both, and the Crown are the ground-landlords of most of it.

Between the proposed site and the Treasury Buildings (which may be called the Home Office block) there are Dover House and the Horse Guards. Why are not the new buildings commenced at the end of the present Government Offices, and these two properties included in the site? There would then, I think, be room (if wished) for a house for the First Lord of the Admiralty without touching Spring-gardens, and the line of Government Offices would be continuous. A reference to the Office of Works map will show the frontages to Whitehall and the Park.

It was said when the site was proposed that it was not intended to touch the Horse Guards. Why not? That edifice is not ancient, and it is not handsome, and it is not necessary for the safety of the British Constitution that the two Horse Guards should sit on horseback in their boxes facing Whitehall from ten till four (or thereabouts) daily, and it seems a strange thing that they should stop a great public improvement. But so it appears to be, as their rooms and stables occupy a great portion of the Horse Guards site. They could, however, mount guard as before, but on foot, as they do at the St. James's Park side. Buckingham Palace or St. James's Palace would be fitting places for their mounting guard on horseback, if thought to be absolutely necessary; but this, perhaps, might be dispensed with altogether.

The Horse Guards site could be built upon, and still called the Horse Guards, and the War Office could be part of it. The view of the parade-ground and the drive through could exist all the same, but the buildings overlooking the Park would be as high as the Home Office block, and the large space now uncovered, or covered with stables, would have offices erected on them. There is a large house,—No. 18, Spring-gardens,—in which Sir John Shaw Lefevre lived, which could be utilised for the officials at the Horse Guards while the new buildings are being erected.

The course suggested will not prevent the Government Offices being continued to Spring-gardens hereafter if necessary, but it will prevent a large sum being needlessly wasted now, and a large number of houses used as offices (which are much wanted in the neighbourhood) being pulled down without their being required.

If any M.P. will kindly give the question and the map a little study, he will soon no doubt be able to convince himself of the reasonableness of the proposition, and also of the fact that "the Horse Guards' sentries stop the way," at a probable cost to the country of many thousands a year. He can then ask the Commissioner of Works "Why the new Admiralty and War Office cannot be commenced next to the Home Office block, so as to form a continuous line of offices, and save a large sum of money to the country." A RATEPAYER.

DARLINGTON SCHOOLS COMPETITION.

SIR,—As an unsuccessful competitor in this, permit me to express the astonishment with which I read the intimation in your last issue that the School Board, which had refused to call in an umpire, had selected the design by the son of one of its own members. Further, I notice in newspaper reports that Mr. Brooks, sen., took part in the decision, and voted for his son's design.

I make no suggestion that Mr. Brooks, sen., knew that "Hope" was by his own son, but I am assured that it was a notorious fact in Darlington long before the decision was made known. A COMPETITOR.

ENGINEERS' FORMULA.

SIR,—Can any engineer assist me in the following? Two points are taken at an equal distance above the ground, the distance between each being 17 ft. From the first point a body is allowed to fall by the action of gravity. How far will it have fallen when it is moving with the greatest angular velocity as seen from the second point? The above data is required for constructing some machinery.

ENGINEER.

"THE STUDENT'S GUIDE."

SIR,—In the review of this work in the *Builder* for May 31 [p. 805], it is stated that "on Plate III. are 'framed chimney-grounds.'" I beg to say that in the new edition the illustration referred to has been removed from the plate, and the term "chimney-grounds" has been struck out of the text. The reviewer must have confounded the new edition with the former ones, in which "chimney-grounds" appear on Plate III. E. WYNDHAM TARN.

MEETINGS.

SATURDAY, JUNE 14.

International Health Exhibition Conference.—Dr. A. Wynter Blyth and Mr. Wm. Eassie on the "Disposal of the Dead: Cremation." 2 p.m.

St. Paul's Ecclesiological Society.—Visits to the Churches of Seal and Kemsing, and to the Church and Remains of the Archiepiscopal Palace at Otford. Train from Holborn Viaduct, 2.40.

Edinburgh Architectural Association.—Annual Excursion to Jedburgh, Kelso, and neighbourhood.

MONDAY, JUNE 16.

London and Middlesex Archæological Society.—(1) Mr John Sachs on "Arms and Armour." (2) Mr. Thomas Milbourn on "Mediæval London at the Health Exhibition: Historical Associations." 8 p.m.

International Health Exhibition.—Lecture by Professor J. P. Sheldon, F.C.S., on "The English Diary." 5.30 p.m.

Royal Asiatic Society.—(1) Professor Lacouperie "On Three Embassies from Indo-China to the Middle Kingdom about B.C. 1100, and the Way thither." (2) Dr. Duka "On the Tibetan MSS. of Csoma de Körös, given by Dr. Dr. S. Malan to the Hungarian Academy of Sciences." 4 p.m.

TUESDAY, JUNE 17.

International Health Exhibition—Lecture by Mr. J. F. Hodgetts on "Anglo-Saxon Dress, Food, and Houses." 5.30 p.m.

Institute of British Carriage Manufacturers (Westminster Town-hall).—Mr. W. T. Shorthouse on "The Art of the Carriage-axle Manufacturer." 7.30 p.m.

Royal Meteorological Society.—Commemoration Dinner at the Holborn Restaurant. 6.30 p.m.

WEDNESDAY, JUNE 18.

Builders' Foremen and Clerks of Works Institution.—Half-yearly Meeting. 8 p.m.

Royal Meteorological Society.—Mr. R. H. Scott on "The Equinoctial Gales,—Do they occur in the British Isles?"; Surgeon-Major Black on "The Climate of the Delta of Egypt in 1798-1802, during the French and British Campaigns"; and two other papers. 7 p.m.

THURSDAY, JUNE 19.

Society of Antiquaries.—(1) Major Cooper-Cooper, F.S.A., "On Some Clay Bars and Pottery from Bedfordshire." (2) Mr. Edwin Freshfield, V.P., on "The Palace of the Greek Emperors of Nicea at Nymphio." 8.30 p.m.

Chemical Society.—8 p.m.

Miscellanea.

British Archæological Association.—The closing meeting of this association for the present session was held on the 4th inst, Mr. Thos. Morgan, F.S.A., in the chair. Mr. J. W. Grover, F.S.A., read a description of a tumulus still existing in the grounds of one of the modern houses in Cedars-road, Clapham-common, which is shown on old maps prior to the district being built over. It is called Mount Nod, but there is no evidence to show if it is of comparatively modern or prehistoric date. The old house of Sir Dennis Gordon, where Pepys died, stood close to the spot. A discussion ensued, in which Messrs. Compton, Kershaw, Brock, and others took part, reference being made to the old Huguenot Cemetery, Mount Nod, at Wandsworth, nearly two miles away, being called by the same name, apparently from the fields, so called, extending to these. The position is an enclosed one, commanding a view over the Thames Valley. Excavations will probably be made. Mr. Roach Smith, F.S.A., contributed a paper, read by Mr. W. de Gray Birch, F.S.A., on Old Winchester, in which he showed that the so-called Roman camp is in reality an ancient British Oppidum of considerable size. Mr. Loftus Brock, F.S.A., read a paper on an ancient chapel of thirteenth century date, which still exists at the entry into Dover, close to the Maison Dieu, hidden behind the modern houses of Biggin-street, and hitherto unnoticed. It is used as a blacksmith's shop and for various other purposes. The Reverend Prebendary Scarth forwarded a paper, read by Mr. Birch, on an ancient harpsichord which formerly belonged to Tasso. It was at Sorrento, and is dated 1564. It is decorated with paintings of Apollo and the Muses, and is in fair condition. The connection between the harpsichord and other similar instruments with the piano of modern times was referred to and discussed. The progress of the arrangements for the Congress at Tenby were detailed. The meeting will commence on Sept. 2, ending on the 11th, the Bishop of St. David's being president.

Infectious Diseases Hospital for Oxford. The Oxford Local Board have accepted a tender for the erection of an Infectious Diseases Hospital, from the plans of Mr. W. H. White, M. Inst. C.E., their surveyor. There will be two detached pavilions, each providing for twelve beds, a special ward pavilion for two beds, an administrative block, laundry, ambulance-house, mortuary, and disinfecting-house. The buildings and grounds will be inclosed by a wall 7 ft. in height. The site, five acres in extent, adjoins the road from Oxford to Abingdon, about a mile from Oxford.

Clacton-on-Sea.—This new watering-place seems to be rising in popular favour, if we may judge from the report of the Clacton-on-Sea Land and Building Company, submitted to the half-yearly general meeting held on the 28th ult. The directors state that the past winter has been very favourable to building operations, and considerable activity in this respect has prevailed at Clacton-on-Sea. Several houses and shops have been erected, and the demand for premises for occupation or purchase is reported to be very good. Amongst the new buildings may be mentioned the Convalescent Home for the county of Essex, erected by the Perry Watlington Memorial Committee. The selection of Clacton-on-Sea for the establishment of this institution is regarded as a gratifying proof of the health-giving nature of its climate. Since the last annual meeting the directors have purchased a further quantity of land at Clacton-on-Sea, situated in the centre of the place and ripe for immediate building. A portion of this land will be offered for sale in plots on the 30th inst., as will be seen by an advertisement in our columns.

The Sunday Society.—A party of members of the Sunday Society visited Apsley House on Sunday last. The Waterloo Gallery, Museum, and other rooms, with their historical collections, were thrown open. Amongst those present were Sir Arthur Hobhouse, Rev. Wm. Rogers, and the hon. sec., Mr. Mark H. Judge. On the motion of the Rev. Wm. Rogers, a most cordial vote of thanks was passed to his Grace the Duke of Wellington for thus opening his house to the members of the Society. The Society has prepared a memorial to the Executive Council of the International Health Exhibition, praying that the Exhibition be opened on at least one Sunday afternoon in each month. "This," they urge, "would not only make the Exhibition available to the thousands who now on Sundays visit the Kew Museums, the Hampton Court Galleries, and the Painted Hall at Greenwich, but would prove a boon to thousands besides who cannot afford the expense attending a visit to the exhibitions located in the distant suburbs named."

Building Improvements in Cheapside.—The Land and House Investment Society having purchased the lease for eighty years of the premises in Cheapside between Wood-street and Gutter-lane, are at present erecting a pile of new buildings on the site. A portion of the block nearest to Wood-street has just been completed. The ground-floor is intended for shops, and the upper portion of the premises for offices and chambers. The elevation is faced with Portland stone, and is carried to a height of nearly 60 ft. One of the principal features in the façade consists of massive three-light oriel windows on the second floor, the carving and moulding of the stone work being rich and elaborate. The elevation is surmounted by gables and dormers. The company themselves intend to occupy a part of the finished premises. Messrs. Ford & Hesketh, of Aldermanbury, are the architects, and Mr. W. Brass, of Old-street, is the contractor.

Society of Arts.—The Albert Medal of the Society of Arts, instituted in 1862 as a memorial of his Royal Highness the Prince Consort, and given annually "for distinguished merit in promoting arts, manufactures, or commerce," has been awarded by the Council of the Society, with the approval of his Royal Highness the Prince of Wales, the President, to Captain James Buchanan Eads, "the distinguished American engineer, whose works have been of such great service in improving the water communications of North America, and have thereby rendered valuable aid to the commerce of the world."

New Colossal Group.—According to the *Tägliche Rundschau* a group has just been completed at Frankfürt-on-Main by Professor Gustav Kaupert, of the Städel Institute, which has been receiving much attention in artistic circles. It has occupied the artist for three years, and is entitled "Perseus and Andromeda." The moment selected for illustration is that at which the hero of the story has killed the dragon and is carrying off Andromeda. The group is about 8 ft. in height.

Darlington Free Library.—The corner stone of this new building was laid on the 4th inst. by Sir J. W. Pease, the building being the gift to the town of the late Mr. E. Pease. The architect is Mr. G. G. Hoskins, of Darlington, and the cost of the building will be between 7,000*l.* and 8,000*l.*

Soft v. Hard Water.—At a meeting of the Society of Engineers, held on Monday, the 9th inst., at the Westminster Town-hall, Mr. Arthur Rigg, President, in the chair, a paper was read by Mr. J. C. Fell, on "Soft *v.* Hard Water for Manufacturing Purposes." The author commenced by giving the chemical distinctions between hard and soft water, and the practical distinction between temporary and permanent hardness, and explained what salts held in solution constituted the hardness. The author then proceeded to point out the loss of economy resulting from the use of too hard water in steam boilers, and in the bleaching and brewing trades, and its injurious effect upon animal and vegetable life. The evils of hard water having been described, the author gave the various softening processes in use, and their comparative advantages, instancing Prof. Clarke's chemical process and Mr. Porter's improvements thereupon, Mr. Maignen's anti-calcaire process, and Mr. Field's Electrical Scale Preventer. The paper was elucidated by a series of experiments.

Value of Land in Westminster. — Last week Messrs. Horne, Son, & Eversfield offered for sale, at the Auction Mart, the freehold site of building land in Westminster, adjoining the new Town-hall, belonging to the Guardians of St. George's Union. The property covers an area of nearly 34,000 superficial feet, and has a frontage of 155 ft. to Caxton-street and a back frontage of 110 ft. to St. Ermin's-hill. The auctioneer pointed out that there would shortly be a direct thoroughfare between Victoria-street and the new Town-hall, which would greatly increase the value of the land now submitted for sale, while its close proximity to St. James's Park was also in its favour. There was a large attendance at the sale, with an active and spirited competition for the property, which was ultimately sold for 25,000*l.*, being at the rate of about 15s. per foot.

Dairy Show, Agricultural Hall.—This is fixed for October 7th to 10th inclusive, the last day for entries being Monday, August 25th. The show will include designs for a dairy homestead on a farm of 180 acres, comprising a ground plan of the house, and plans, sections, and elevations of farm buildings; total cost not to exceed 2,520*l.* Further particulars about this and the general exhibits may be obtained from Mr. F. Morrison, secretary, 191, Fleet-street. As the day fixed for last entries allows a good period before the opening, we hope it is intended that this exhibition shall be in order when opened, which exhibitions at the Agricultural Hall very seldom are.

An Electric Railway in Switzerland.—It is proposed to construct an electric railway between the Hôtel des Alpes at Chillon and the Hôtel de Mont Fleury at Montreux. The difference in altitude of these two points is about 180 mètres. Preliminary experiments have already been made. An electric motor placed on the car drives a cog-wheel; this wheel gears into a central cogged rail, and in this way the car is made to traverse the ascent. Conductors placed alongside the central rail convey the current of the generator, which is driven by a five-horse-power locomotive. It is intended to drive the dynamo by water-power for the future.—*Electrician.*

Examination of Local Surveyors and Inspectors of Nuisances.—At an examination held by the Sanitary Institute of Great Britain, on June 5th and 6th, twenty-three candidates presented themselves. The Institute's certificate of competency to discharge the duties of local surveyors was awarded to W. H. Radford, J. B. Wilson, Charles Gilby, and W. Tattersall; and to discharge the duties of inspectors of nuisances, R. Gibbs, G. W. Jobbings, Kenneth Cameron, T. S. Ainge, T. Turner, R. Jeffery, J. Parker, J. Mallinson, W. A. Shadrake, W. C. Beck, T. Haslam, F. T. Poulson, J. Whyte, A. Sutcliffe, and C. J. Easton.

St. Botolph, Aldgate, Church Restoration Fund.—What may be called a Mediæval Bazaar in aid of this fund is to be opened at the Cannon-street Hotel, on the 17th inst., by the Lord Mayor. "St. Buttolf's Fayre," as it is called on the quaintly-worded programme, will include "Ye famous Streete of Aldgate in ye antiente Ward of Portsoken." The bazaar will remain open on the 18th and 19th.

New Warehouse and Factory, Warwick-lane.—The contractor for these works, referred to on p. 843 of last week's *Builder*, was Mr. J. O. Richardson, of Albert-road, Peckham-rye, not Messrs. "Richardson & Son."

Metal Industry of Greece.—Since the year 1862, considerable attention has been paid to the above industry, which had been brought to a high degree of progress in Ancient Greece. More than 1,000 workpeople are now engaged in connexion with the metal trade, and the capital employed is about 3,000,000*l.* sterling. Saurium, the most important seat of the industry, has only commenced its existence as a populated centre since 1863, and it numbers at present 16,000 inhabitants. There are also, throughout Greece, mines of argentiferous lead, zinc, and iron; quarries of ochre and carbonate of magnesia likewise exist, but are not being worked, on account of the necessary capital not being available for the purpose.—*Society of Arts Journal.*

Ryton-on-Tyne. — The Thorp schools, which were erected by the late Archdeacon Thorp, are about to be enlarged, and new porches and latrines added, whilst the playgrounds are to be thoroughly drained to bring the schools more into harmony with modern sanitary requirements. Mr. J. J. Lish, Newcastle-upon-Tyne, is the architect for the works. The same architect is also engaged in carrying out alterations to the Greenside schools, which the Vicar and managers intend to enlarge and supply with better sanitary arrangements.

Value of Cement Works. — A sale which took place at the Auction Mart last week shows Robins & Co.'s Cement Works in Belgravia to be an exceedingly valuable property. Messrs. Rogers, Chapman, & Co. submitted for sale 100 20*l.* shares in the company, 10*l.* per share only having been paid, or 1,000*l.* altogether as the nominal value of the property, for which there was an active demand at high premium rates. The shares realised an aggregate sum of 7,623*l*, amounting to a premium value of nearly 800 per cent.

Winchester.—The selected design for the memorial proposed to be erected at Winchester to commemorate the celebration of the 700th anniversary of the mayoralty of that city was prepared by Mr. J. B. Colson, of Winchester, and submitted in competition (by invitation) with a design by Mr. C. R. Pink, of Winchester and London. The cost will be about 350*l.*

Institution of Civil Engineers for Ireland.—Mr. F. Browne read before this Society, on the 4th ult., a useful and practical paper on "The New Masonry Gas-holder Tank of the Alliance and Dublin Consumers' Gas Company." Those who may have to construct or advise about such a structure will find it worth while to refer to Mr. Brown's paper.

Surveyorship, Toxteth Park Local Board.—The name of the late engineer to this Board was J. A. Hall, not "Hale," as stated in the paragraph on p. 843 of our last number.

TENDERS.

For alterations and additions to St. Marylebone parish church. Mr. Thomas Harris, architect. Quantities by Mr. F. H. A. Hardcastle:—

Trollope	£12,228 0 0
Hall, Beddall, & Co.	11,948 0 0
Wall Bros.	11,579 0 0
Ashby Bros.	11,443 0 0
Conder	11,353 0 0

For the erection of house, cow-sheds, &c., at farm premises in the parish of Brinklow, for the Feoffees of Holy Trinity Church Estate. Mr. Herbert W. Chattaway, architect, Trinity Churchyard, Coventry:—

R. Lord, Coventry	£579 3 0
Hallam & Co., Coventry	570 0 0
R. Wootton, Coventry	550 13 0
J. Worwood, Coventry	511 0 0
T. Mayo, Coventry	500 0 0
Blakeman & Son, Coventry	462 17 0
C. Garlick, Coventry	453 0 0
A. Lester, Coventry (accepted)	426 0 0
T. Wright, Foleshill	383 4 6

For alterations and additions to the Railway Tavern, Streatham Common, for Mr. T. E. Cross. Mr. S. B. Grosvenor, architect, 23, Southampton-buildings, Chancery-lane:—

Johnson	424 0 0
Gould & Brand	399 0 0
Canning & Mullins	397 0 0
Pickersgill	378 0 0
Oldis Bros.	357 4 1
John Anley	348 0 0
Langmead & Way*	334 0 0

* Accepted conditionally.

For pulling down and rebuilding Nos. 200 and 201, Sloane-street. Mr. F. W. Hamilton, architect. Quantities by Mr. C. W. Brooks:—

Kirk & Randall	£4,300 0 0
Turtle & Appleton	4,263 0 0
Oldrey	4,100 0 0
Wall Bros.	3,997 0 0
Chas. Wall	3,950 0 0
Lucas & Son	3,760 0 0
Craske	3,547 0 0

For a detached house in De Pary's-avenue, Bedford, for Mr. F. G. Marks. Mr. John Day, architect, Bedford:—

Kimberley, Banbury	£1,239 0 0
Watts & Lester, Bedford	1,110 0 0
Corby & Son, Bedford	1,092 0 0
Potter, Bedford	1,066 14 0
Foster, Bedford	1,053 0 0
Smith, Bedford	1,029 0 0
Warton & Walker, Bedford*	1,010 0 0

* Accepted.

For a detached house in De Pary's-avenue, Bedford, for Mr. A. G. Shelton. Mr. John Day, architect:—

Knight & Boston, Bedford	£880 0 0
Corby & Son, Bedford	856 0 0
Lilley, Bedford	846 17 0

For additions to shop and premises, High-street, St. Peter's, Bedford, for Mr. Rose, organist. Mr. John Day, architect:—

Foster, Bedford	£399 0 0
Potter, Bedford	395 0 0
Adams, Bedford	395 0 0
Smith, Bedford (accepted)	387 7 0

For a third nave or north aisle to St. Paul's Church, Bedford. Mr. John Day, Diocesan Surveyor, Bedford:—

G. Haynes, Bedford	£3,500 0 0
Foster, Bedford	3,499 0 0
Miskin, St. Alban's	3,250 0 0
Bell & Sons, Cambridge	3,230 0 0
Cornish & Gaymer, North Walsham.	3,150 0 0
Osborne, St. Neot's	2,828 0 0
Franklin, Deddington, Oxon	2,765 0 0
Claridge, Banbury	2,720 0 0
Kimberley, Banbury (accepted)	2,695 0 0

For rebuilding No. 34, King-street, Cheapside. Mr. Richard Creed, architect, No. 45, Great Marlborough-street:—

E. Lawrance & Sons	£2,695 0 0
G. H. & A. Bywaters	2,685 0 0
Wm Brass	2,660 0 0
Wm, Bangs & Co.	2,590 0 0
Patman & Fotheringham	2,577 0 0
Colls & Sons	2,470 0 0
B. E. Nightingale	2,353 0 0

For the erection of four houses in Redman's-road, Mile-end, for Mr. Henry Hymans. Mr. C. A. Legg, architect, Mile-end:—

	Houses.	Boundary Walls, &c.
M. A. Palmer & Sons	£2,245	£95
Hearle & Son	2,245	87
J. Walker	2,163	90
J. Parfitt	2,159	69
S. Barnett	2,141	118
J. R. Hunt	2,121	80
J. Croft	1,889	87
M. Calnan & Co.	1,871	93

For the erection of new church of St. Bede, Liverpool. Messrs. J. E. K. Cutts & A. H. Mackmurdo, architects:—

W. Tomkinson & Son	£6,858 0 0
Jones & Sons	6,807 0 0
J. Henshaw	6,312 10 0
J. Leslie	6,263 0 0
W. Thornton & Sons	6,232 0 0
T. Urmson	6,109 11 6
Hughes & Stirling	6,045 0 0
Brown & Backhouse	6,011 0 0
S. Webster	5,886 0 0

For additions to mansion at Badgemore, near Henley, Oxon, for Mr. Richard Ovey. Mr. John Norton, architect. Quantities by Mr. S. J. Thacker:—

Holland & Hannen	£17,376 0 0
Aldin & Platter	16,678 0 0
Lawrance & Sons	15,284 0 0
Peto Bros.	15,222 0 0
Boyce	14,140 0 0

For St. Andrew's Home and Club, Westminster. Mr E. Gregg, architect. Mr. S. Young, surveyor:—

Hall, Beddall, & Co.	£6,985 0 0
Ashby Bros.	6,542 0 0
L. H. & R. Roberts	6,237 0 0
Peto Bros.	6,175 0 0
Bywaters	5,921 0 0

For the erection of new foundry, pattern-shop, and additions to offices, &c., in Tabard-street, for Messrs. J. Dewrance & Co. Messrs. Geo. Lansdowne & Harris, architects:—

Higgs & Hill	£5,280 0 0
Downs	5,190 0 0
Greenwood	5,189 0 0
Kirk & Randall	5,078 0 0
Rider	4,930 0 0
Wall	4,872 0 0
Shepherd	4,868 0 0
Lea	4,729 0 0
Chappell	4,691 0 0
Conder	4,645 0 0
Hall	4,640 0 0
Colls	4,594 0 0
Canning & Mullins	4,485 0 0
Bird	4,385 0 0
Tarrant & Son	4,200 0 0

For fishing-box and boat-house to be erected at Docket Point, near Chertsey. Mr. C. Welch, architect and surveyor, London-street, Chertsey:—

	Fishing-box.	Boat-house.
H. G. Nesmyth, Chertsey	£1,050 0	£198 15
B. E. Nightingale, Lambeth	929 0	213 0
J. Martin, Addlestone	885 0	150 0
Oades & Son, Egham	837 0	137 0
S. Woods, Weybridge	815 0	130 0
B. J. Hunt, Chertsey*	809 0	135 0

* Accepted.

For house at Bosahan, Meneage, Cornwall, for Mr. A. Pendarvis Vivian, M.P. Mr. Ewan Christian, architect :—

	In Doulting Stone.	In Penryn Granite.
Kellway	£27,701 0 0	£29,547 0 0
Lethbridge & May	25,800 0 0	27,000 0 0
M. & J. Clements	24,046 8 6	26,607 9 6
Paramore & Son	23,137 0 0	25,103 0 0
Blowey	22,700 0 0	24,500 0 0
Beanland	22,547 0 0	24,997 0 0
W. Shurmur	22,444 0 0	25,378 0 0
W. Bone	22,250 0 0	25,250 0 0
Estcourt	21,331 0 0	24,666 0 0
W. Dart	21,681 12 6	24,556 12 6
Oliver & Sons	20,981 0 0	24,483 18 0
Berry	20,900 0 0	22,200 0 0
Foster & Dickson	20,351 0 0	22,888 0 0
Finch & Son	18,268 0 0	23,354 0 0
Clark	17,773 0 0	19,620 0 0

For rebuilding a dwelling-house and shop, for Mr. Owens, in the Roman-road, North Bow. Mr. Charles E. Jackson, architect :—

C. Collins	£514 0 0
G. Hardy	480 0 0
J. Evans	470 0 0
R. Brooks & Son	427 0 0
C. Everard (accepted)	409 0 0

For the erection of new business premises, Market-place, 8, King-street, South Shields, for Mr. Thos. Crofton. Mr. Henry Grieves, architect. Quantities by Mr. G. D. Irwin, Sunderland :—

Alex. Thompson, Gateshead	£2,010 13 11
Jos. Elliott, North Shields	1,728 0 0
Wm. M. Hudson, South Shields*	1,587 19 9
John L. Miller, Gateshead	1,484 6 6

* Accepted.

For new shop, alterations, and additions to property, Wellington-street, South Shields, for Mr. H. T. Duncan. Mr. Henry Grieves, architect, Fowler-street, South Shields :—

John Moore, South Shields	£335 0 0
Haggerston & Ormsby, South Shields	325 0 0
Geo. W. Weddle, South Shields*	313 0 0

* Accepted.

For the erection of a detached residence in Shepherd's Hill-road, Hornsey, for Mr. W. Love. Mr. John Hamilton, architect :—

Boyce	£1,606 0 0
Hayworth	1,545 0 0
Scott	1,495 0 0
Calow	1,457 0 0
H. Harper	1,418 0 0
Harris & Wardrop	1,396 0 0
Shurmur	1,386 0 0
Harris	1,330 0 0
Woolveridge Bros., Clapton*	1,315 0 0

* Accepted.

For the erection of a mission church and vestry, in the parish of St. Michael and All Angels, Maidstone. Mr. H. Bensted, architect :—

Wallis & Clements	£844 0 0
Froud, jun.	837 0 0
Avard	793 0 0
Elmore	770 0 0
Vaughan (accepted)	747 0 0

(All of Maidstone.)

For five cottages, Tottenham. Mr. Francis G. Lee, architect :—

Wilkinson, Finsbury Park	£1,493 0 0
Seward, Bermondsey	1,445 0 0
Mallinson, Shepherd's-bush	1,433 10 0
Baxter, Upton	1,246 0 0
Webb & Rosser, Hammersmith	1,175 0 0
Dickeson, Battersea	1,167 0 0
W. J. Wheeler, Richmond	1,000 0 0
Lanzell, Tottenham	990 0 0
Manning, Barnes	950 0 0
Sanders, Dulwich	950 0 0
Bullock, Kentish-town	945 0 0
Wyman, Edmonton (accepted)	930 0 0

For making-up roadway and paving the footways of Falstaff-yard, Tabard-street, for the Vestry of St. George the Martyr, Southwark. Mr. A. M. Hiscocks, engineer and surveyor :—

Treherne	£246 0 0
Beavers	220 0 0
Mowlem & Co.	192 0 0
Rock Asphalte Company	175 0 0
Wheeler & Hindle	174 0 0
G. Butler (accepted)	163 0 0

For proposed new Board-room at Hampton Wick, for the Local Board. Mr. R. T. Elsam, architect, Surveyor to the Board. Quantities supplied by the architect :—

Kent Bros., Kingston	£718 5 0
Wheatley & Sons, East Molesey	698 0 0
T. J. Messom, Twickenham	690 0 0
J. Spinks & Sons, Hampton Wick	678 0 0
C. & F. Adkins, Surbiton	677 0 0
J. H. Jarvis, Surbiton Hill	649 0 0
Babbs Bros., Surbiton Hill	645 0 0
W. R. Woods, Hampton Wick	635 0 0
T. Brunsden & Co., Brentford	630 0 0
Harris, Teddington	630 0 0
C. T. Bartlett, Teddington	625 0 0
W. Brown, Kingston	613 15 0
E. Wells, Kingston	600 0 0
C. E. Oldridge & Sons, Norbiton	599 10 0
John Piller, Teddington	584 0 0
Thos. Hiscock, Hounslow	530 0 0
C. Bonell, Teddington (accepted)	540 0 0

For the restoration of the tower and south aisles of St. Matthew's Church, Ipswich. Mr. Bisshopp, architect, Ipswich :—

R. S. Smith, Ipswich	£1,377 7 0
G. Kenney, Ipswich	1,174 10 0
T. Thwaites, Ipswich	1,165 0 0
R. Tooley, Ipswich (accepted)	1,075 0 0

For the completion of "Branksomdene," Honor Oak, for Mr. E. P. Trenchard. Mr. Herbert D. Appleton, architect, Wool Exchange :—

Avis & Son	£935 0 0
H. L. Holloway	658 0 0
M. Redman	625 0 0

For alterations and additions to the Marquis of Granby tavern, Drury-lane, for Messrs. Barclay, Perkins, & Co. Mr. E. F. Pollard, architect :—

Forrest	£258 0 0
Langmead & Way	244 0 0
Beale (accepted)	226 0 0

Grand Hotel, Brighton.—In the list of tenders for works here (published on p. 844), Messrs. James Smith & Sons' tender should have been marked "accepted."

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

TO CORRESPONDENTS.

W. R. M. (we know the statue you mention).—J. J. L.—P. A.—A. W. (it is of no value to us).—W. C., Brussels (your letter is both uncourteous and uncalled for, and attributes motives which have no existence whatever).

Correspondents should address the Editor, and *not* the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

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